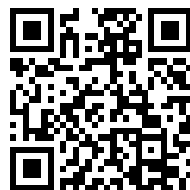


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# THE BLACK SEA PILOT

COMPRISING  
THE DARDANELLES, MARMARA DENİZİ,  
THE BOSPORUS, BLACK SEA, AND  
SEA OF AZOV

ELEVENTH EDITION,  
1969



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Comprising

THE DARDANELLES, MARMARA DENİZİ,  
THE BOSPORUS, BLACK SEA, AND  
SEA OF AZOV

ELEVENTH EDITION, 1969

**OBSCLETE EDITION**

PUBLISHED BY THE HYDROGRAPHER OF THE NAVY  
1969

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<b>Tenth Edition</b>	.	.	.	.	<b>1955</b>

## Advertisement to the Eleventh Edition

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The Black sea pilot contains a description of the shores of the Dardanelles, Marmara denizi, the Bosphorus, Black sea, and Sea of Azov.

This, the eleventh edition, has been prepared by Captain G. A. French, C.B.E., Royal Navy, and contains the latest information received in the Hydrographic Department.

The meteorological information has been revised by the Meteorological Office. Temperature is expressed in degrees Celsius, rainfall in millimetres, speed in knots, and distance in sea-miles, unless expressly stated otherwise. Information received from meteorological services which do not use these units has been converted into the units mentioned above by the Meteorological Office.

The information on radar ranges, tabulated in Appendix III, has been prepared and supplied by the United Kingdom Chamber of Shipping.

Mariners and others are invited, in the interests of navigation, to forward to the Hydrographer of the Navy, Ministry of Defence, Taunton, Somerset, England, any information that may come under their notice, which would be useful for the correction of the Charts and other Hydrographic Publications issued by the Hydrographic Department; *early* advice as to newly discovered dangers, the establishment of, or changes in, any aids to navigation, is specially requested.

Copies of a form (H.102) on which to render information can be obtained *gratis* from the Hydrographer of the Navy, at the address above or from any of the Admiralty Chart agents in Great Britain and abroad, a list of whom is published, annually, in Admiralty Notice to Mariners No. 2.

By the publication of this volume the tenth edition of the Black Sea Pilot, 1955, and Supplement No. 7, 1968, are cancelled, and all information affecting that work contained in Notices to Mariners, up to and including No. 850 of 1969, has been embodied in this volume; for Temporary and Preliminary Notices to Mariners affecting this edition, the list of Temporary and Preliminary Notices to Mariners in force, published monthly in the weekly edition of the Admiralty Notices to Mariners, should be consulted.

G. S. RITCHIE,  
*Rear Admiral,  
Hydrographer of the Navy.*

*Hydrographic Department,  
Ministry of Defence,  
Taunton, Somerset.  
23rd May, 1969.*

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## Glossary

### GLOSSARY OF TURKISH GEOGRAPHICAL TERMS AND WORDS USED IN THIS VOLUME AND ON THE CHARTS

Turkish	English	Turkish	English
Ada, Adası,	Island, Islet	Dil . . .	Isthmus, point
Adalar		Doğu . . .	East, sunrise
Ağaç . . .	Tree	Dok . . .	Dock
Ağız . . .	Mouth of a river	Döküntü . . .	Reef
Ak . . .	White	Düba . . .	Pontoon
Akarsu . . .	Running water		
Aşağı . . .	Lower	Eski . . .	Old, ancient
Ayazma . . .	Sacred spring	Ev . . .	House
Balçak . . .	Clay mud, silt	Fabrika . . .	Factory
Bankı . . .	Bank, shoal	Fener . . .	Lighthouse, lantern
Baş . . .	Head, chief		
Batak batağı,	Swamp, marsh,	Geçit . . .	Pass, defile, ford
bataklık	quicksand	Gemi yatağı . . .	Ship's berth
bataklı		Göl . . .	Lake, pond
Batı . . .	West, west wind	Gümrük . . .	Customs
Bel . . .	Pass	Gün doğrusu . . .	East, east wind
Berzah . . .	Isthmus, strait	Güney . . .	South
Beyaz . . .	White		
Bikın . . .	Beacon	Harabe . . .	Ruins
Boğaz . . .	Strait, channel, estuary	Hastahane, hastane . . .	Hospital
Bora . . .	Sudden storm	Havuz . . .	Artificial basin, dock
Burnu, burun	Point, headland, cape, promontory	Hisar . . .	Fortress
Buz . . .	Ice		
Bük . . .	Bay, creek	İçilecek su, içilecek su . . .	Drinking water
Büyük . . .	Great	İrmak . . .	River (big)
		İç . . .	Inner
Cami . . .	Mosque	İrtifa . . .	Height, altitude, elevation
Cankurtaran	Life-saving	İskele . . .	Quay, landing place
Çay . . .	River, stream	İstasyon . . .	Station
Cenub, p . . .	South		
Çeşme . . .	Fountain	Kaba Kum . . .	Gravel
Çiftlik . . .	Farm	Kale . . .	Castle, fort
Çorak . . .	Marsh (Salt)	Kanal . . .	Canal, channel
		Kaplica . . .	Thermal spring
Dağ . . .	Mountain	Kapu . . .	Gate, pass
Dalgarkiran	Breakwater	Kara . . .	Black or Land
Dalyan . . .	Fishery, enclosure for netting fish	Kare . . .	Isolated hill, rock
Değirmen . . .	Mill	Kava . . .	Desert
Demiryeri . . .	Anchorage	Kaya . . .	Rock
Deniz Tayyare	Seaplane	Kilse . . .	Red
Meydani } anchorage		Kırmızı . . .	Red
Deniz . . .	Sea	Kışla . . .	Barracks
Derbent . . .	Defile, pass	Kıyı . . .	Coast, shore
Dere . . .	Valley, stream	Kızıl . . .	Red
Derin . . .	Deep		
Derinlik . . .	Depth		

**GLOSSARY OF TURKISH GEOGRAPHICAL TERMS—continued**

Turkish	English	Turkish	English
Koltuk . . .	Creek	Sarp . . .	Cliff, steep
Körfez . . .	Gulf, bay	Sed, set . . .	Mole
Koy . . .	Bight, cove	Sehir . . .	City, town
Köy . . .	Village	Simal . . .	North
Kule . . .	Tower	Sığ . . .	Shallow
Kum . . .	Sand	Sıglik . . .	Bank, shoal
Kuru . . .	Dry	Sirt . . .	Ridge
Küçük . . .	Small	Su . . .	Water, river, stream
Kuzey . . .	North	Su akıntısı . . .	Current
Liman, limanı . . .	Harbour, port	Susuz . . .	Waterless
Limanreiai . . .	Harbour Master	Sünger . . .	Sponge
Lodos . . .	South-west, south-west wind	Tabya . . .	Battery
Manastır . . .	Monastery	Takimada . . .	Group of islands
Mansap, Mansab . . .	Estuary, river mouth	Taş . . .	Stone
Mendirek . . .	Mole	Taşlık . . .	Stony ground
Mezarlik . . .	Cemetery	Tatlı . . .	Sweet, fresh
Minare . . .	Minaret	Telefon . . .	Telephone
Nehir, nehri . . .	River	Telgraf . . .	Telegraph
Nisan . . .	Beacon	Tepe . . .	Hill, peak
Nisi . . .	Island	Tersane . . .	Dockyard
Ocak . . .	Quarry, mine	Tophane . . .	Arsenal
Orman . . .	Forest	Topuk . . .	Bar (of river)
Orta . . .	Middle	Tuz . . .	Salt
Ova . . .	Plain	Vaha . . .	Oasis
Pınar . . .	Spring, fountain	Vilâyet . . .	Province
Posta telgraf . . .	Post telegraph	Yalman . . .	Peak
Poyraz . . .	North-east	Yar . . .	Cliff, precipice, abyss
Şamandira . . .	Buoy	Yarımada, ası . . .	Peninsula
Şancak . . .	Flag, district	Yayla . . .	Plateau
Sarı . . .	Yellow	Yeni . . .	New
Sark . . .	East	Yeşil . . .	Green
		Yıldız . . .	Star, north, north-wind
		Yol . . .	Channel
		Yukarı . . .	High, upper, top

## NOTES ON TURKISH WORDS

1. Turkish words are frequently modified by suffixing particles. The suffixes occurring most often in this volume are:—

SUFFIXES	SIGNIFICATION	EXAMPLE
-lar, -ler . . . . .	Plural . . . . .	Adalar, islands, from ada, island.
-ı, - , -i-u, -ü . . . . .	Possessive . . . . .	Samsun körfezi, Bay of Samsun, from körfez, bay.
- sı -ei, -sü, su, after a final vowel	Possessive . . . . .	Marmara adası, Island of Marmara, from ada, ie- island.
-lik, lık . . . . .	Adjective from noun, or <i>vice versa</i>	Kaya, rock; kayalık, rocky. Derin, deep; derinlik depth.

2. The Turkish nouns "ada", an island, and "burun" a point, are used when they are preceded by an adjective, for example, Kara burun, Buyuk ada; when preceded by a noun, the Turkish words "adası" and "burnu" are used, for example Marmara adası, Ereğlice burnu.

3. Pronunciation:—

In Turkish a is pronounced as "u" in cut.

"	â	"	"	"ar" in cart.
"	c	"	"	"j" in jack.
"	ç	"	"	"ch" in chest.
"	e	"	"	"e" in elf.
"	ğ	"	"	unpronounced with a, o, ı, u.
"		"	"	"y" in you with e, ö, i, ü.
"	i	"	"	"ee" in eel.
"	ı	"	"	"i" in ill.
"	j	"	"	"z" in azure.
"	o	"	"	"o" in hold.
"	ö	"	"	"ea" in earth.
"	ş	"	"	"sh" in ship.
"	u	"	"	"oo" in ooze.
"	ü	"	"	"e" in yew.

The remaining consonants are pronounced as in English.

## SYSTEM OF ORTHOGRAPHY

For the latest information on this subject, *see* N.P.100—*The Mariners' Handbook*.

# GLOSSARY OF BULGARIAN WORDS AND GEOGRAPHICAL TERMS

Bulgarian	English	Bulgarian	English
Arkipelag . . .	Archipelago	Minare . . .	Minaret
Bair . . . . .	Hill, hillock	Mis . . . . .	Promontory
Balkan . . . . .	Mountain	Mitnitsa . . .	Custom house
Beti . . . . .	White	Mogila . . . .	Mound, tomb
Boaz . . . . .	Defile, gorge	Nizh-en, -na, -no	Low, lower
Bolnitsa . . . .	Hospital	Nos . . . . .	Cape, promontory
Brod . . . . .	Ford	Nov, -a, -o . .	New
Bryag . . . . .	Shore, coast, bank	Ostrov . . . .	Island
Cher-en, -na -no	Black, dark	Pesok . . . . .	Sand
Cherkva . . . .	Church	Planina . . . .	Mountain range
Cheshma . . . .	Spring, fountain	Poluoostrov . .	Peninsula
Chiflik . . . . .	Farm	Polyana . . . .	Plateau
Chukar . . . . .	Cliff, peak	Potok . . . . .	Stream, brook
Dere . . . . .	Gorge, ravine	Pristanishte . .	Port, harbour, wharf
Dol . . . . .	Defile, ravine	Proliv, Protok .	Strait
Dolina . . . . .	Valley, dale	Provlak . . . .	Isthmus
Dŭbrava . . . .	Forest	Pustinya . . . .	Desert
Dzhamiya . . . .	Mosque	Ravnina . . . .	Plain
Egrek . . . . .	Sheep-fold	Ravnishte . . .	Plateau
Ezero . . . . .	Lake, pond	Reka . . . . .	River
Fabrika . . . . .	Factory	Rid . . . . .	Ridge, hill
Far . . . . .	Lighthouse	Sever . . . . .	North
Fener . . . . .	Light	Sever-en, -na, -no	Northern
Gol, a-o . . . .	Bare, barren	Shirok, -a, -o .	Broad, wide
Golyam . . . . .	Large	Skelya . . . . .	Pier
Gora . . . . .	Forest	Sred-en (or -ni), -na, -no . . . .	Middle, central
Iztochnik . . . .	Source, spring	Star, -a, -o . .	Old
Iztok . . . . .	East	Suh, -a, -o . . .	Saint
Kale . . . . .	Fort	Sveti . . . . .	Dry
Kamen . . . . .	Stone, rock	Tesnina . . . . .	Strait, pass
Kanal . . . . .	Canal, channel	Tumba . . . . .	Tumulus
Kanara . . . . .	Cliff, rock	Ustie . . . . .	Mouth of stream, estuary
Key . . . . .	Quay	Vodenitsa . . .	Mill
Klisura . . . . .	Gorge, defile, pass	Vodopad . . . .	Waterfall
Korab . . . . .	Ship	Yug . . . . .	South
Khan . . . . .	Inn	Yuzh-en, -na, -no	Southern
Khanishte . . .	Locality with several Inns	Zaliv . . . . .	Gulf, bay
Khŭlm . . . . .	Hill	Zamŭk . . . . .	Castle
Kula . . . . .	Tower	Zapad . . . . .	West
Les . . . . .	Forest	Zapad-en, -na, -no	Western
Liman . . . . .	Gulf, lagoon		
Lŭka . . . . .	Dale, valley, bend of river		
Mal-ŭk, -ka, -ko	Small		
Manastir . . . .	Monastery		
Melnitsa . . . .	Mill		

## TRANSLITERATION OF BULGARIAN GEOGRAPHICAL NAMES

The following system for the transliteration of Bulgarian, devised by the United States Board on Geographic Names (BGN) and published by them in May, 1949, was accepted for British official use by the Committee in September, 1952, and should be referred to as the BGN/PCGN System.

<i>Bulgarian</i>	<i>Transliteration</i>	<i>Bulgarian</i>	<i>Transliteration</i>
А а	a	П п	p
Б б	b	Р р	r
В в	v	С с	s
Г г	g	Т т	t
Д д	d	У у	u
Е е	e	Ф ф	f
Ж ж	zh	Х х	kh
З з	z	Ц ц	ts
И и	i	Ч ч	ch
Й й	y	Ш ш	sh
К к	k	Щ щ	sht
Л л	l	Ъ ъ	ŭ
М м	m	Ь ь	' (apostrophe)
Н н	n	Ю ю	yu
О о	o	Я я	ya

# GLOSSARY OF RUMANIAN WORDS AND GEOGRAPHICAL TERMS

Rumanian	English	Rumanian	English
Alb, -ă . . .	White	Neagră, negru . . .	Black
Apus, -ul . . .	West	Nisip, -ul . . .	Sand
Baliz-ă, a . . .	Buoy, beacon	Nomol, -ul . . .	Mud
Bazin-ul . . .	Basin, wet dock	Nord, -ul . . .	North
Biseric-ă, a . . .	Church	Nou, -ă . . .	News
Braş-ul or u . . .	Branch, arm		
Cap-ul, -u . . .	Cape, headland, promontory	Oraş, -ul . . .	Town, city
Cătun . . .	Hamlet	Ostrov, -ul . . .	Island
Chei-ul . . .	Quay, wharf		
Deal, -ul; Dîmb, -ul . . .	Hill, hillock	Pădure . . .	Wood, forest
Debarcader, -ul . . .	Pier, quay, landing place	Peatr- or Piatr-ă, -a . . .	Stone, rock
Dig, -ul . . .	Jetty, stone pier	Pîrâu, -l . . .	River, brook
Est, -ul . . .	East	Pod, -ul . . .	Bridge
Estic . . .	Eastern	Port, -ul . . .	Port, harbour
		Prund, -ul . . .	Sandy shore, gravel
		Puţ, -ul . . .	Well, spring
Far, -ul . . .	Lighthouse, beacon		
Ghiol, -ul . . .	Lake, lagoon	Recif, -ul . . .	Reef
Girl-ă, -a . . .	River, stream	Rîu, -l . . .	River, Spring
Glod, -ul . . .	Marsh, mud	Roş or Roşu . . .	Red
Golf, -ul . . .	Gulf		
Gur-ă, -a . . .	Mouth	Sat, -ul . . .	Village
		Sec, Seacă . . .	Dry, arid
Han, -ul . . .	Inn	Sfantul . . .	} Saint
		Sfînt, -ă, -ul . . .	
Înalt, ă . . .	High, tall	Stn de Mare . . .	Bay, inlet
Insul-ă, -a . . .	Island	Spital, -ul . . .	Hospital
Istm, -ul . . .	Isthmus	Splaiu, -l . . .	Quay, wharf
		Staro . . .	Old
Juiuk or Juk . . .	Hill, mound	Stînc-ă, -a . . .	Rock, cliff
Lac, -ul or -u . . .	Lake	Strîmtoare . . .	Pass, straits
Lagun-ă, -a . . .	Lagoon	Sud, -ul . . .	South
Liman, -ul . . .	Haven, harbour	Şes, -ul . . .	Plain
Mal, -ul . . .	Shore, coast, bank of river		
Mic, -ă . . .	Small	Tărm, -ul . . .	Shore, coast, bank
Mîl, -ul . . .	Mud, silt	Turl-ă, -a . . .	Steeple, cupola
Moar-ă, -a . . .	Mill	Turn, -ul . . .	Tower
Munte, -le . . .	Mountain		
		Vad, -ul . . .	Ford
		Vam-ă, -a . . .	Custom house
		Veche, vechiv . . .	Old
		Vest, ul . . .	West

## TRANSLITERATION OF RUMANIAN GEOGRAPHICAL TERMS

Rumanian is in structure a Romance language, but in vocabulary more than half Slavonic, besides including many words borrowed from Greek, Magyar, Turkish, &c. It is written in the Latin character, with diacritical marks to represent Slavonic sounds.

The spelling of Rumanian place-names was until recently in a very chaotic condition, the various official maps sometimes showing as many as six different forms for the same name, e.g. Bucuresciu, Bucuresci, Bucurescii, Bucuresti, Bucureştii, and Bucureşti, for the capital, whose name is really pronounced Bukuréshtı (the last vowel being almost inaudible). Happily, Rumanian orthography has recently undergone another of its frequent reforms, which has simplified the spelling by abolishing a number of unnecessary letters.

A guide to Rumanian pronunciation follows:—

a	.	.	as "a" in father.
c	.	.	as in cut; or in chit (before e and i).
ch	.	.	as in choir.
g	.	.	as in get; but as in gem (before e and i).
gh	.	.	as in gherkin.
f	.	.	as "ea" in earth (approximately).
j	.	.	as "s" in measure.
ş	.	.	as "sh" in ship.
ţ	.	.	as "ts" in bats.



# GLOSSARY OF RUSSIAN GEOGRAPHICAL TERMS

Russian	English	Russian	English
Baklyah . . .	Rock above water	Luda, ludka . . .	Small rocky islet
Balka . . .	Gully, Ravine	Mal-yy-aya-oye . . .	Little, small
Banka . . .	Shoal	Materik . . .	Mainland
Bar . . .	Bar	Mel' . . .	Shoal
Bashnya . . .	Tower	Melk-iy-aya-oye . . .	Shallow
Basseyu . . .	Basin, wet dock	Mol . . .	Mole
Bel-yy-aya-oye . . .	White	More . . .	Sea
Bereg . . .	Shore, river bank	Mys . . .	Cape, point, headland
Bol'sh-oy-aya-oye . . .	Great, large	Navolok, nos . . .	Cape, point, headland
Bryuga . . .	Pier, landing stage	Nizhn-iy-yaya-eye . . .	Lower
Bugor . . .	Hillock	Nizk-iy-aya-oye . . .	Low
Bukhta . . .	Bay, inlet	Nov-yy-aya-oye . . .	New
Burun . . .	Breaker	Oblast' . . .	Province
Chern-yy-aya-oye . . .	Black	Obryv . . .	Bluff
Del'ta . . .	Delta	Ostrov . . .	Island
Derevnya . . .	Village	Ostrovok . . .	Islet
Derevo . . .	Tree	Osy' . . .	Landslide
Dlinn-yy-aya-oye . . .	Long	Otmel' . . .	Shoal
Dolina . . .	Valley	Ozero . . .	Lake
Dom . . .	House	Pakh'ta . . .	Bluff, cliff
Doroga . . .	Road	Perebor, perekat . . .	Bar
Farvater . . .	Channel	Peredn-iy-yaya-eye . . .	Front
Gavan' . . .	Harbour, basin	Peresheyek . . .	Isthmus
Girlo . . .	River mouth	Pervyy-aya-oye . . .	First
Glubok-iy-aya-oye . . .	Deep	Peschan-yy-aya-oye . . .	Sandy
Golomyann-yy-aya-oye . . .	Ocean, sea	Pesok . . .	Sand
Gora . . .	Mountain, hill	Pirs . . .	Jetty, pier
Gorod . . .	City, town	Poberezh'ye, pomor'ye . . .	Coast, sea-shore
Greben, gryada . . .	Ridge	Podvodn-yy-aya-oye . . .	Submerged
Guba . . .	Gulf, bay, inlet	Poluoostrov . . .	Peninsula
Ilist-yy-aye-oye . . .	Muddy	Port . . .	Port
Kamen' . . .	Rock, stone	Poselok . . .	Village
Kanal . . .	Channel, canal	Pristan' . . .	Pier, landing stage
Kekur . . .	Pillar rock	Prokhod . . .	Passage, pass
Kholm . . .	Hill, hillock	Proliv . . .	Strait
Khrebet . . .	Ridge, chain of hills	Protok . . .	Creek
Korga . . .	Rocky shoal	Reka, rechka . . .	River, stream
Kosa . . .	Spit	Reyd . . .	Roadstead
Kovsh . . .	Cove	Rif . . .	Reef
Kraan-yy-aya-oye . . .	Red	Salma, shar . . .	Strait, channel
Kryazh . . .	Chain of mountains	Seleniye, selo . . .	Settlement, village
Laguna . . .	Lagoon	Severn-yy-aya-oye . . .	Northern
Lednik . . .	Glacier		
Liman . . .	Estuary		

GLOSSARY OF RUSSIAN GEOGRAPHICAL TERMS—*continued*

Russian	English	Russian	English
Skala . . .	Rock, cliff	Vorota . . .	Gap, gate, entrance
Sopka . . .	Hillock, mound	Vostochn-yy-aya-oye	Eastern
Sredn-yy-yaya-eye	Middle	Vostok . . .	East
Stamik . . .	Shoal, rock	Vtor-oy-aya-oye	Second
Star-yy-aya-oye .	Old	Yug . . .	South
Strelka . . .	Narrow spit	Yuzhn-yy-aya-oye	Southern
Tolst-yy-aya-oye .	Thick	Zadn-iy-yaya-eye	Rear
Tonk-iy-aya-oye .	Thin	Zaimka . . .	Settlement, farm
Tret-iy-'ya-'ye .	Third	Zaliv . . .	Gulf, bay, inlet
Tserkov' . . .	Church	Zapad . . .	West
Ust'ye . . .	River mouth	Zapadn-yy-aya-oye	Western
Utes . . .	Crag, cliff	Zastruga . . .	Long, sandy drying shoal
Verkh-iy-aya-eye	Upper	Zavod' . . .	Cove, creek, inlet
Vkhod . . .	Entrance	Zelen-yy-aya-oye	Green
Vneshn-iy-yaya-eye	Outer	Zemlya . . .	Land
Vnutrenn-iy-yaya-eye	Inner		
Vodopad . . .	Waterfall		

SEA ICE TERMS AND RUSSIAN EQUIVALENTS

English	Russian
<b>DEVELOPMENT</b>	
Arctic pack . . .	Mnogoletniy léd or Arkticheskiy pak
Bay-ice . . .	Mnogoletniy léd zalivov
Ice crystals/Frazil crystals	Ledyanoy igly
Ice island . . .	Ledyanoy dreyguyushchiy ostrov
Ice-rind . . .	Témnyy nilas
Ice-shelf . . .	Shel'fovyy léd
Ice-slush . . .	Ledyanoye salo
Medium winter-ice .	Serobelyy léd (Serobelyy melodik)
New ice . . .	Nachal'nyye vidy l'dov
Pancake ice . . .	Blinchtayy léd
Polar ice . . .	Polyarnyy léd
Sludge . . .	Shuga
Slush or sludge . . .	Ledyandye salo i shuga
Snow slush . . .	Snezhura
Thick winter-ice . .	Belyy léd
Winter-ice . . .	Zimniy léd
Young ice . . .	Molodoy léd
Young polar ice . .	Dvukhletniy léd

English	Russian
<b>FORMS OF FAST ICE</b>	
Anchor ice/Ground ice . . . . .	Stoyak
Bay-ice . . . . .	Mnogoletniy léd zalivov
Fast-ice . . . . .	Nepodvizhnyy léd
Grounded hummock . . . . .	Stamukha
Icefoot . . . . .	Podoshva pripay
Pack-ice/Drift-ice . . . . .	Dreyfuyushchiy or Plovuchiy léd
Polar fast-ice . . . . .	Nepodvizhnyy polyarnyy léd
Shore ice . . . . .	Pripay
Winter fast-ice . . . . .	Zimniy pripay
Young shore ice . . . . .	Ledyanoy zabereg
<b>CLOSENESS</b>	
Close pack-ice/drift-ice . . . . .	Splochnyy léd
Open pack-ice/drift-ice . . . . .	Razrezhénnyy léd
Very close pack-ice/drift-ice . . . . .	Ochen' splochnyy léd
Very open pack-ice/drift-ice . . . . .	Redkiy léd
<b>SIZE OF FLOES</b>	
Bergy-bit . . . . .	Krupnyy Nesyak or oblomok aysberga
Big ice-floe . . . . .	Bol'shiye ledyanye polya
Brash-ice . . . . .	Ledyanaya kasha
Growler . . . . .	Malyy nexyak or kusok aysberga
Ice-cake . . . . .	Melkobityy léd
Ice-floe/Floe . . . . .	Ledyanye polya i krupnyye l'diny
Medium ice-floe . . . . .	Malye ledyanye polya
Small ice-cake . . . . .	Kuski l'da
Small ice-floe . . . . .	Krupnobityy léd
Vast ice-floe . . . . .	Obshirnyye ledyanye polya
<b>ARRANGEMENT</b>	
Bay/Bight . . . . .	Bukhta or zaliv vo l'du
Belt . . . . .	Poyas l'da
Ice-bar . . . . .	Splochnaya kromka
Ice-edge . . . . .	Kromka l'da
Ice-field/Field of ice . . . . .	Skopleniye dreyfuyushchego (plovuchego) l'da
Ice limit . . . . .	Granitsa arednogo raspostraneniya l'da
Large ice-field/field of ice . . . . .	Bol'shoie skopleniye dreyfuyushchego (plovuchego) l'da
Medium ice-field/field of ice . . . . .	Sredneye skopleniye dreyfuyushchego (plovuchego) l'da

English	Russian
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**ARRANGEMENT—*continued*.**

Open ice-edge . . . . .	Razrezhennaya kromka
Patch . . . . .	Pyatno l'da
Small ice-field/field of ice . . . . .	Maloye skopleniye dreyfuyushchego l'da
Stream/Strip/String . . . . .	Polosa l'da
Tongue . . . . .	Yazyk l'da

**CONSTRUCTION AND  
SURFACE FEATURES**

Bare ice . . . . .	Bezanezhnyy léd
Hummock . . . . .	Toros
Hummocked ice . . . . .	Torostistyy léd
Ice breccia/Ice mosaic . . . . .	Smoroz
Level ice . . . . .	Rovnyy léd
Pressure ice/Screw ice . . . . .	Deformirovanny léd
Pressure ridge . . . . .	Gryada torosov
Rafted ice . . . . .	Nasloyenny léd
Ram . . . . .	Ledyanoy taran
Snow-covered ice . . . . .	Zasnezhnyy léd
Standing floe . . . . .	Ropak
Weathered ice . . . . .	Sglazhenny polyarnyy léd

**OPENINGS IN THE ICE**

Crack . . . . .	Treshchina
Lead/Lane . . . . .	Kanal
Open water . . . . .	Chistaya voda
Polynya . . . . .	Polynya
Polynya off the edge of shore ice . . . . .	Zapriptsynaya polynya
Pool . . . . .	Razved/e
Shore lead . . . . .	Progalina
Shore polynya . . . . .	Pribrezhnaya polynya
Tide crack . . . . .	Prilivnaya treshchi na

**STAGES OF MELTING**

Brash-ice . . . . .	Ledyanaya kasha
Dried ice . . . . .	Obsokhshey léd
Rotten ice . . . . .	Gniloy léd
Snow water on the ice/Puddle . . . . .	Snezhnitsy
Thawing holes in the ice . . . . .	Protaliny

# SEA ICE TERMS AND RUSSIAN EQUIVALENTS—*continued*

English	Russian
<b>ICE OF LOCAL ORIGIN FOUND AT SEA</b>	
Bergy-bit . . .	. Oblomok
Brash-ice . . .	. Ledyanaya kashna
Firn snow/Neve . . .	. Firn
Glacier berg . . .	. Paramidalnyy aysberg
Glacier ice . . .	. Gletchernyy led
Glacier tongue . . .	. Lednikovyy yazyk
Growler . . .	. Kusok aysberga
Iceberg . . .	. Aysberg
Ice island . . .	. Ledyanoy dreyfuyushchiy ostrov
Ice-shelf . . .	. Shel'fovyy lednik
Tabular berg/Barrier berg	. Stoloobraznyy aysberg
<b>SKY AND AIR INDICATIONS</b>	
Frost smoke . . .	. Moroznoye pareniye
Ice-blink . . .	. Ledovyy otblesk
Water-sky . . .	. Vodyanoye nebo

# TABLE FOR THE TRANSLITERATION OF RUSSIAN GEOGRAPHICAL NAMES

Russian (properly "Great Russian") is the principal Slavonic language using the Cyrillic alphabet, the latter being largely based on the Greek, but including some letters of unknown, possible Eastern, origin.

The rules for pronunciation and accent are so complicated, and contain so many exceptions, that it would be out of place to give them here. For these and other reasons it has been decided, after full consideration, that Russian words will be spelt, not as they are pronounced, but as they are written; in fact, a letter-for-letter transliteration has been adopted.

The Permanent Committee on Geographical Names (P.C.G.N.), in agreement with the United States board of Geographical Names (U.S.B.G.N.) has approved the use of the following table for the transliteration of Russian, which has the advantage over previous tables of mechanical applicability.

<i>Russian</i>	<i>Transliteration</i>	<i>Russian</i>	<i>Transliteration</i>
А а	a	Р р	r
Б б	b	С с	s
В в	v	Т т	t
Г г	g	У у	u
Д д	d	Ф ф	f
Е е	ye, e (see note 1)	Х х	kh
Ё ё	yě, ě ( „ )	Ц ц	ts
Ж ж	zh	Ч ч	ch
З з	z	Ш ш	sh
И и	i	Щ щ	shch
Й й	y	Ь ь	" (double apostrophe) see note 2)
К к	k	Ы ы	y (apostrophe)
Л л	l	Ь ь	' (apostrophe)
М м	m	З з	e
Н н	n	Ю ю	yu
О о	o	Я я	ya
П п	p		

## Notes:—

1. ye initially, after vowels, and after Ъ and Ь; "e" elsewhere; when written as ě in Russian, transliterate as yě or ě.
2. transliterated by the double apostrophe even when found written as a single apostrophe in Russian.



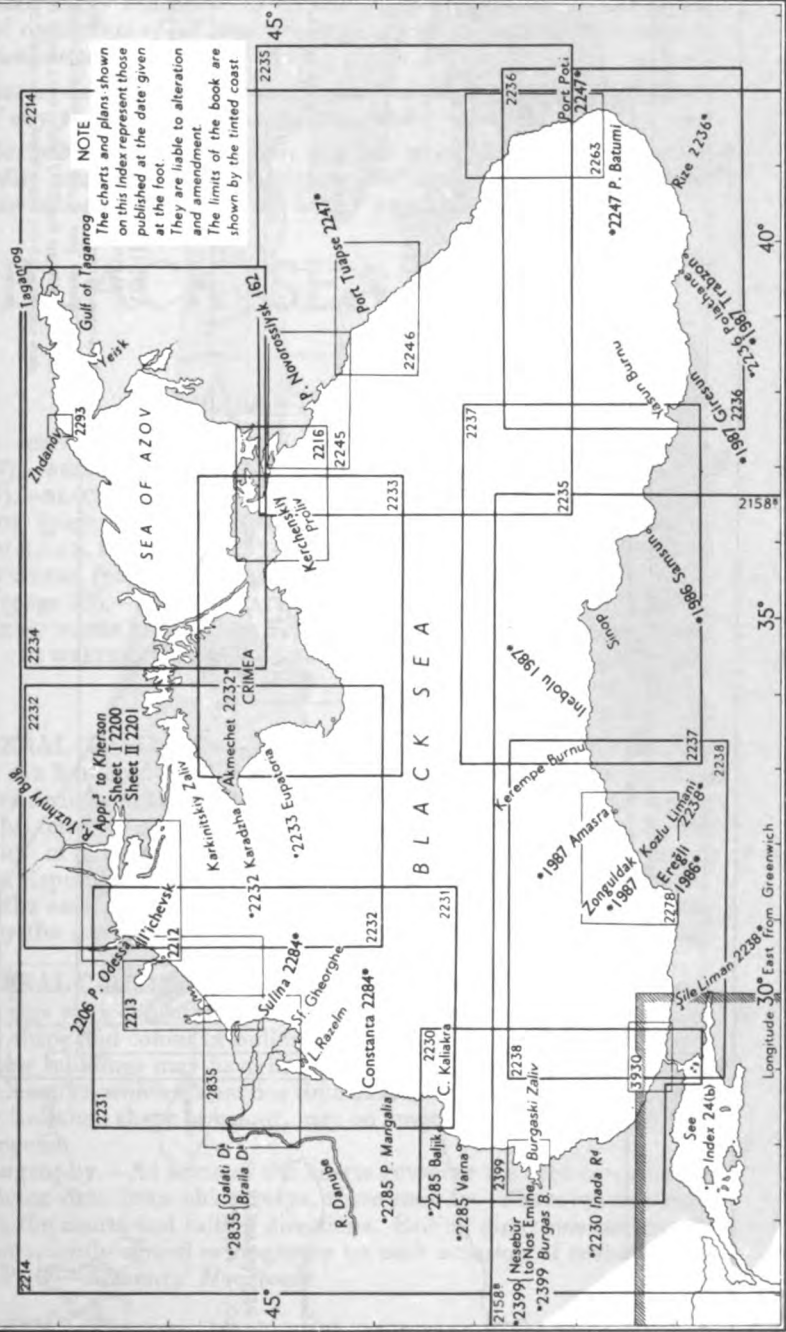
30° 35° 40°

INDEX TO ADMIRALTY CHARTS ALLUDED TO IN THIS WORK

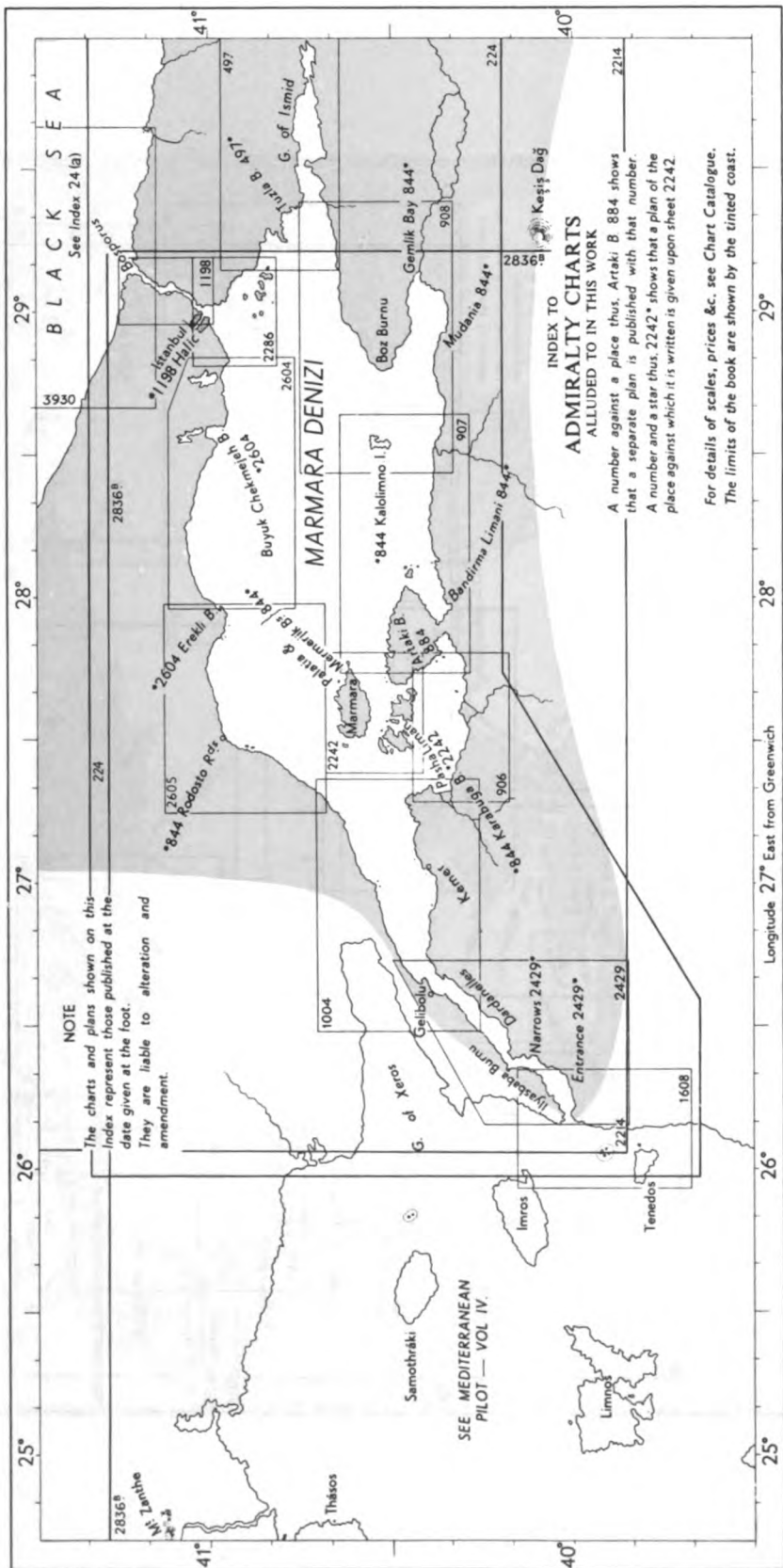
A number against the name of a place shows a separate plan is published bearing that number.

\*2237 indicates that a plan of the place against which it is written is given upon sheet 2237.

For details of scales, prices &c. see Chart Catalogue.







## LAWS AND REGULATIONS APPERTAINING TO NAVIGATION.

*While, in the interests of the safety of shipping, the Hydrographic Department makes every endeavour to include in its publications details of the laws and regulations of all countries appertaining to navigation, it must be clearly understood :—*

- (a) *that no liability whatever can be accepted for failure to publish details of any particular law or regulation, and*
- (b) *that publication of the details of a law or regulation is solely for the safety and convenience of shipping and implies no recognition of the international validity of the law or regulation.*

# BLACK SEA PILOT

## CHAPTER I

GENERAL REMARKS AND CAUTIONS (page 1).—TURKEY (page 1).—BULGARIA (page 3).—RUMANIA (page 4).—DANUBE COMMISSION (page 5)—U.S.S.R. (page 6).—BLACK SEA (page 8).—REGULATIONS FOR DARDANELLES AND BOSPORUS (page 9).—MINES (page 13).—PILOTAGE (page 14).—REGULATIONS IN U.S.S.R. PORTS (page 15).—ICEBREAKERS (page 16).—SIGNALS (page 17).—BUOYAGE (page 22).—OTHER NAVIGATIONAL AIDS (page 24).—LIFE-SAVING (page 25).—ADMINISTRATIVE (VARIOUS) (Page 26).—ICE (Page 27).—RANGE OF WATER LEVEL (Page 37).—CURRENTS (Page 39).—CLIMATE AND WEATHER (Page 53).—CLIMATIC TABLES (Page 68).

**GENERAL REMARKS.**—The shores of the area covered by this volume are bordered by the following territories:—In the Dardanelles, Marmara denizi and the Bosphorus, by the European (Trakya) and Asiatic (Anadolu) territory of the Republic of Turkey. In the Black sea, by the Republics of Turkey, Bulgaria, Rumania and the Union of Soviet Socialist Republics on the west; on the north, including the Sea of Azov, and on the east, by the Union of Soviet Socialist Republics; and on the south by the territory of Asiatic Turkey, known as Anadolu (Anatolia). 5

**GENERAL CAUTIONS.**—**Landmarks.**—With respect to the descriptions in this work concerning trees, many of which are from old surveys, and the shape and colour of buildings, etc., caution should be exercised; many new buildings may have been erected and old trees destroyed, so that such marks, which may at one time have been conspicuous on account of their isolation, shape or colour, may no longer exist or now be difficult to distinguish. 10

**Orthography.**—As some of the charts covering the area described in this volume date from old surveys, there may be differences in names between the charts and sailing directions. Sailing directions conform to the most recently agreed orthography on each occasion of revision. See also N.P.100—*Mariners' Handbook*. 15 20

**TURKEY.**—**History.**—In the 10th century a number of Turkish tribes emerged from central Asia and in the year 1288 the Ottoman Empire was founded by Osman I. During succeeding centuries the Ottomans

gradually acquired more of the Byzantine Empire, absorbing the whole of it after their capture of Constantinople in 1453. In subsequent conquests the Ottoman Empire advanced into Syria, Mesopotamia, and Egypt, and reached their western limit before Vienna in 1529.

- 5 In the 19th century Russia and the European powers, together with internal troubles, combined to weaken the Ottoman Empire, and the Turkish fleet was destroyed by a combined Russian, French and British fleet at Navarino in 1827. Due to the Russian aspirations for the control of Constantinople the Crimean war was fought from 1854 to 1856,  
10 France and Britain supporting Turkey.

Continual unrest occurred in the Balkans for the rest of the 19th century, leading to two Balkan wars in 1912-1913, which further reduced the Turkish Empire. As a consequence of the First World war the boundaries of Turkey were reduced to a small area round Istanbul  
15 (Constantinople), and Anadolu (Anatolia).

In 1922 and 1923 the Sultanate was abolished and the Ottoman Empire came to an end. Modern Turkey came into being under the leadership of Mustafa Kemal, subsequently known as Kemal Atatürk.

- Constitution.—Administration.**—Turkey became a Republic on 29th  
20 October, 1923, and on 20th April, 1924, a revised constitution declared the Turkish state to be a republic, the religion of which was Islam, the official language Turkish and the capital Ankara (39° 57' N., 32° 54' E.). On 10th April, 1928, the reference to Islam was deleted and Turkey declared to be a secular republic.

- 25 A new constitution was approved in 1961. Legislative power is vested in the Grand National Assembly, executive power in the President of the Republic and the Council of Ministers, judicial power in independent courts.

- Administratively the country is divided into İl, now 67 in number,  
30 divided into İlçe, sub-divided in their turn into Bucak. At the head of each İl is a Vali, representing the government. Each İl has its own elective council.

- Area and population.**—The area of Turkey, including lakes, is 301,302 square miles (780,576 square km.), of which the area in Europe (Trakya)  
35 is 23,721 square km. (population in 1960; 2,284,625), and in Asia (Anadolu), 756,855 square km.; population in 1960; 25,470,195.

The census population of Turkey in 1965 was 31,391,207. The population of Ankara, in 1965, was 902,200.

- Production and trade.**—The principal products are cotton, tobacco,  
40 cereals, figs, silk, olives and olive oil, dried fruits, nuts, mohair, skins, hides, furs, wool, gums, canary seed, linseed and sesame. Half the exports of leaf tobacco go to the U.S.A. The principal centre for silk production is Bursa (page 125).

- The Turkish provinces are reported to be rich in minerals, and Turkey  
45 is one of the four principal producers of chrome in the world.

Sixteen oil companies were operating and exploring for oil in 1964. In May, 1965, a new steel works at Ereğli (page 422) went into operation.

A tourist industry is developing.

- In 1964 the principal exports were tobacco, cotton, fruits followed by  
50 minerals and cereals. The chief imports were machinery, oil, iron and steel, vehicles, fabrics.

- Currency.—Weights and measures.**—The Turkish *Lira* (TL) is divided into 100 *Kurus* (*piastres*). The coins in circulation are of the values of 1, 5, 10 and 25 *Kurus*; 1, 2½ and 10 *Lira*. Bank notes are widely  
55 used.

The value of the Turkish *Lira* was 21·60 to £1 sterling, and 9·02 to U.S.\$1, in 1968.

The metric system of weights and measures is used in the Custom houses and in the various State departments, elsewhere the old system, as given below, may be found:—

1 Oke	= 400 drams	= 2·8264 lbs.	
1 Batman	= 6 Okes	= 16·958 lbs.	
39·6263 Okes		= 1 cwt.	
1 Cantar	= 44 Okes	= 124·3616 lbs.	
1 Cheki	= 195 Okes	= 551·148 lbs.	10
1 Kileh		= 0·9120 bushels.	
1 Arshin (Cloth)		= 26·96 inches.	
1 Endaze		= 25·555 inches.	
1 Arshin: Land)		= 29·830 inches.	

The Gregorian calendar was finally adopted in 1926 and the employment of European numerals was made obligatory by law in 1929. *Charts 2214, 449.*

**Communications.**—There are numerous facilities for communication by sea between ports in the Dardanelles, Marmara denizi, and the Black sea coast of Turkey; these facilities are much augmented in summer months by vessels carrying grain. 20

The more important ports are connected to the general railway system. Most places of any importance are connected to the general telephone and telegraph system.

In 1964, there was a total of 7,929 km. of railway, all state-owned, of which 28 km. were electrified. 25

A line connecting Muş ( $38^{\circ} 42' N.$ ,  $41^{\circ} 30' E.$ ), about 180 miles south-eastward of Trabzon (page 443) with Iran was opened in October, 1964.

There is frequent and regular air service between the international airports at Ankara, İstanbul and all principal countries. A regular air service plies between Ankara and Cyprus. 30

**National day.**—October 29th (Republic day).

**British Diplomatic representatives.**—The British Embassy is located at Ankara.

There are British Consular offices at Ankara and İstanbul. 35

**BULGARIA.**—The Republic of Bulgaria is bounded on the north by Rumania, on the west by Yugoslavia, on the east by the Black sea and on the south by Greece and Turkey.

**History.**—For centuries the area formed part of the Ottoman Empire. The Principality of Bulgaria and the Autonomous Province of Eastern Rumelia, both under Turkish suzerainty, were constituted by the Treaty of Berlin in 1878. In 1885 Rumelia was re-united with Bulgaria. In 1908 Bulgaria became independent of Turkey. As a consequence of the First world war Bulgaria ceded some territory to Greece and the newly-created Yugoslavia. 40 45

The Bulgarian People's Republic was proclaimed in 1946.

**General remarks.**—The total area of the country is 42,823 square miles (110,911·5 square km.) and, at the census of 1965, the population was 8,226,564.

Sofia ( $42^{\circ} 42' N.$ ,  $23^{\circ} 19' E.$ ), the capital and commercial centre of the country had a population in 1965, of 800,953. It is on the main railway line to İstanbul, 338 miles from the port of Varna and 125 miles from Lom on the River Danube. 50

Bulgarian ports on the River Danube are Russe with a population, in

1965, of 128,384; Svishtov, population 18,537 and Vidin with a population of 23,984.

The Black sea ports of Burgas and Varna are described on pages 180 and 184.

5 **Production and trade.**—Bulgaria is mainly an agricultural country but an extensive industrialisation programme is in hand. Most of the agriculture has been collectivised and some of it has been mechanised. The principal crops are wheat, maize, beet, tomatoes, tobacco, oleaginous seeds, fruit, vegetables and cotton.

10 **Considerable progress is being made in the exploitation of the mineral resources, especially coal and steel.**

The principal imports are wool, industrial and agricultural machinery, metals, tools, chemicals, dyes, drugs, rubber, paper. The principal exports are cereals, tobacco, fruit, vegetables, oils, chemicals, hard woods,

15 non-ferrous metals, and livestock.

In 1960, 82% of Bulgaria's foreign trade was with Eastern European countries, including 54% with the Soviet Union.

**Currency.—Weights and measures.**—The unit of currency is the *lev*, which, in 1952, was linked to the Soviet rouble, the parity then being  
20 one *rouble* equals 1·70 *leva*. A new *lev*, equalling 10 old *leva* was introduced on 1st January, 1962. The parity (clearing value) is one (new) rouble = 1·30 (new) *lev*. The official rate of exchange, in 1968, is £1 = 2·80 *leva*.

The metric system is in general use.

25 **Ports.—Communications.**—The principal ports on the Bulgarian coast are Burgas (Burghaz) and Varna, both of which are connected with the general railway system.

Foreign vessels, except those of Russian nationality, are now only permitted to call at Burgas.

30 The principal towns and villages are connected with the general telephone and telegraph system.

There is regular air service from Burgas and Varna to Sofia, and thence to Budapest, Prague and Moscow and most European capitals.

**National day.**—9th September (Day of Freedom).

35 **British Diplomatic representatives.**—The British Ambassador resides at Sofia.

A British Consular officer is stationed at Sofia.

**RUMANIA.—History.**—In classical times what is now called Rumania included the Roman provinces of Dacia and Scythia Pontica;  
40 also the later Danubian principalities of Wallachia and Moldavia.

The principalities were ruled by Turkey until 1866, when the Hohenzollerns succeeded and a new constitution was made. In 1878 Rumania was declared an independent Kingdom by the Treaty of Berlin, incorporating parts of Dobrudja, seized by Rumania from Bulgaria. After the  
45 First world war, Bessarabia, Bukovina and Transylvania were added, but during the Second world war, on a Soviet ultimatum in 1940, Rumania ceded Bessarabia and North Bukovina to U.S.S.R. and returned South Dobrudja to Bulgaria.

In 1947 King Michael abdicated and a republic was proclaimed.

50 **General remarks.**—The Republic of Rumania has an area of 91,671 square miles (237,428 square km.) with a total population, in 1966, of 19,105,056.

The present constitution of the government was voted on 21st August, 1965. The capital is Bucharest, known to Rumanians as Bukuréshti,  
55 which had a population, in 1966, of 1,650,000.

Rumania is divided into 16 administrative regions.

The headquarters of the Danube flotilla, and the main river port is Braila (45° 15' N., 27° 59' E.) (page 207) which had a population, in 1966, of 138,587. Other river ports are Sulina (page 201) and Galati (page 206).

The naval school is at Constanța.

**Production and trade.**—Petroleum is the principal industry of Rumania and is the mainstay of the economy. 13,451,000 metric tons were produced in 1966. Coal, steel and pig-iron are also produced in large quantities.

Complete collectivisation of agriculture was officially stated to have been achieved in 1962. Wheat, potatoes, maize, sunflower seed and barley are the principal crops.

Considerable developments are taking place in the production of electric power and a Rumanian-Yugoslav agreement of June, 1963, provides for the building between 1964 and 1971 of a hydro-electric power plant on the Iron Gates (*see* page 195) between Gura Vail in Rumania, and Sip in Yugoslavia. It is to have a yearly production of 11,000 Kwh.

Imports are chiefly semi-manufactured goods, raw materials, machinery and metals.

Exports consist principally of maize, wheat, barley, oats, petroleum, timber and cattle.

**Currency.—Weights and measures.**—The unit of currency is the *leu*, plural *lei*, which is equivalent to 100 *bani*. In 1952, the *leu* was pegged to the Soviet rouble. On 4th August, 1961, after the re-valuation of the Soviet rouble, the exchange rate was fixed at 100 *lei* = 15 *roubles*; 1 *rouble* = 6·67 *lei*. In 1967, 14·4 *lei* were equivalent to £1, and 6 *lei* to U.S. \$1. New legal tender consists of bank bills in the denominations of 10, 25 and 100 *lei*, issued by the State bank, and Treasury notes of state of one *leu*, 3 *lei* and 5 *lei*.

The metric system of weights and measures is used.

**Communications.**—There is regular communication, by sea, between Constanța, which is open throughout the year, and the Danube ports (page 193) via Sulina.

Constanța, Brăila and Galați are connected with the general railway system.

All the principal towns and villages are connected with the general telegraph system.

There is regular air communications between Bucharest and other Eastern European capitals. Bucharest airport is at Băneasa, 4½ miles from the centre of the city.

**National day.**—23rd August (Liberation day).

**British Diplomatic representatives.**—The British Ambassador resides at Bucharest.

There is a British Consular officer at Bucharest.

**DANUBE COMMISSION.**—Navigation on River Danube is controlled by the Danube Commission whose headquarters are at District 6, Benczur U.25, Budapest, and formerly were in Belgrade.

The European Commission of the Danube is a survival from pre-1939, and has its headquarters in Rome, but no longer has any direct connection with the navigation of the river itself. It was brought into being by the Treaty of Paris in 1856, and, before 1914, consisted of a delegate from each of the following countries:—Austria-Hungary, France, Germany, Great Britain, Italy, Rumania, Russia, and Turkey. By the Convention of the Danube of 1921, as modified on March 2nd, 1939, the commission

was composed of representatives from Great Britain, France, Italy, and Rumania, and, after March 1st, 1939, also from Germany.

The peace treaty of 10th February, 1947, stipulates that navigation on the Danube shall be free and open to all nationals, mercantile vessels, and trade of all states, on a footing of equality.

### UNION OF SOVIET SOCIALIST REPUBLICS. (U.S.S.R.).—History.

—The earliest rulers of European Russia were Vikings, welcomed by Slavs to combat invasions from eastward. By the 11th century the country consisted of a number of warring principalities stretching from Novgorod to Kiev and had adopted Christianity. Subsequently, in the struggle against the Tatars the Muscovites attained pre-eminence and Ivan III took the title of "Ruler of all the Russias". For some centuries the territorial expansion was eastward, but in the 18th century Peter the Great (1672–1725) and Catherine II (1729–1796) turned Russian aspirations westward.

In subsequent years the government became less efficient and more autocratic. Russia suffered defeat in the Crimea in 1854, and in the war against Japan 1904–05. Revolution broke out in 1905 but was repressed. The rule of the Tsars broke down in the exhaustion of the First world war, and revolution again broke out in 1917. Power was seized by the Bolsheviks under the leadership of Lenin. Peace with Germany was signed at Brest-Litovsk in March, 1918.

**General remarks.**—The Soviet Union, with a total area, in 1964, of 8,599,766 square miles is by far the largest state in the world. The total population was estimated to be, in 1968, about 237,000,000.

The capital is Moscow, with an estimated population, in 1967, of 6,464,000.

The Union is composed of 15 union-republics. In each republic there is growing urbanisation and in 1964 there were 26 towns with a population of over 500,000 as opposed to 11 in 1939.

The northern shores of the Black sea are part of the Republic of Ukraine, parts of the eastern shore are in the Russian Soviet Federal Socialist Republic (R.S.F.S.R.) and the south-eastern shore between the vicinity of Batumi (page 416) to northward of Sukhumi is in the Republic of Georgia.

The Republics of Armenia, and of Azerbaidjan lie south-eastward of Georgia between the Black sea and the Caspian sea.

**Sea ports and inland waterways.**—The most important ports in U.S.S.R.; Odessa, Nikolayev, Kherson, Taganrog, Rostov, Kerch', Sevastopol, Novorossisk, and Batumi lie around the Black sea and Sea of Azov, and are described in this volume.

Inland waterways, both natural and artificial, are of great importance to the country. The great rivers of European Russia flow outwards from the centre linking all parts of the plain with the chief ports, an immense system of navigable waterways which carries about 269,000,000 tons of freight each year. They are supplemented by a system of canals which provide a through traffic between the White, Baltic, Black and Caspian seas. The most notable of them within the area of this book are the 63-mile long Volga–Don canal linking the Baltic and White seas in the north to the Caspian sea, Black sea and Sea of Azov in the south, which was completed in 1952. In October, 1964, work was started on a canal linking the Baltic and Volga, and suitable for 5,000-ton vessels, the southern end being at Kahovka at the mouth of Reka Dnepr.

**Railways.**—There was a total of 132,500 km. of railways in 1967.

In 1967, 92% of all goods traffic and 55% of passenger traffic was carried by rail.

**Air lines.**—In 1966 there was a total of about 480,000 km. of internal air lines.

External services are maintained with 43 countries and 20 foreign lines have regular services to U.S.S.R. 5

**Currency.—Weights and measures.**—As from 1st January, 1961, the gold content of the *rouble* was raised from 0·222 168 to 0·987 412 grammes. At the same date a new currency was issued for internal purposes, equalling 1 *new rouble* with 10 *old roubles*. The *rouble* is divided into 100 *kopeks*. 10

The currency in circulation is (i) State Bank notes in denominations of 10, 25, 50 and 100 *roubles*; (2) Treasury notes in denominations of 1, 3 and 5 *roubles*; (3) Cupro-nickel coins in denominations of 10, 15, 20 and 50 *kopeks* and one *rouble*; (4) cupro-zinc coins in denominations of 1, 2, 3 and 5 *kopeks*. 15

In 1968 the official exchange rates were 90 *kopeks* = U.S. \$1., and 2·16 *roubles* = £1.

The metric system of weights and measures is used.

The old Russian weights and measures are as follows:— 20

1 Verst (500 sazhen) . . . = 3,500 feet (1066·8).

1 Sazhen (3 arshin) . . . = 7 feet (2·1).

Note.—A nautical sazhen = 6 feet (1·8).

1 Arshin (16 vershok). . . = 28 inches.

1 Pound (96 zolotnik = 32 lot) . . . = 0·90283 lb. 25

1 Pood (40 pounds) . . . = 36 lbs. English.

1 Vedro (8 shtoff) . . . = 2·7056 imperial gallons.

1 Chetvert (8 chetverik) . . . = 5·7719 imperial bushels.

The Gregorian calendar is used.

**National day of the U.S.S.R.**—November 7th (Commemorating the October Bolshevik Revolution of 1917.) 30

**British Diplomatic representatives.**—The British Ambassador resides in Moscow.

There are no British Consulates in the U.S.S.R., apart from the Consular section in Moscow. 35

**Russian Soviet Federal Socialist Republic (R.S.F.S.R.)**—The R.S.F.S.R. is the largest and most important of the Republics forming the U.S.S.R. (see page 6). It occupies the major half of the European part and the major northern half of its Asiatic part and makes up 77% of the total territory of the U.S.S.R. and about 56% of its total population. 40

This Republic occupies one of the first places in the world for mineral wealth.

Vine, tobacco and other southern crops are grown on the Black sea shore of the Caucasus. Industrially the R.S.F.S.R. occupies first place in the U.S.S.R. 45

The ports in R.S.F.S.R. which come within the purview of this volume are Rostov-on-Don, Taganrog and Tuapse.

**Ukraine.**—This Republic, the second largest in population, in the U.S.S.R. lies in the south-western part of the European part and was formed in 1917. It now consists of 25 provinces. 50

Its capital, Kiev (50° 30' N., 30° 28' E.), with a population, in 1967, of about 1,371,000, is the oldest city in Russia and was founded in the 9th century A.D. and was the capital of the Russian state from A.D. 865 to 1240.

The ports of Ukraine are listed in Appendix II and are described in this volume. 55



**Georgia.**—The Georgian Soviet Socialist Republic occupying the north-western part of Transcaucasia lies on the shore of the Black sea and borders on the south-east of Turkey; *see* page 446.

The capital, Tbilisi (Tiflis) ( $41^{\circ} 42' N.$ ,  $44^{\circ} 46' E.$ ) had a population, 5 in 1967, of about 842,000. Other important towns are Kutaisi (population 156,000, in 1967), Batumi (page 416), Sukhumi (page 404), Rustavi, Poti (page 408) and Gori.

Protected from the north by the Caucasian mountains, and receiving in the west the warm, moist winds from the Black sea into which most of its rivers flow, Georgia is outstanding for its fine, warm climate and its 10 natural wealth, variety and beauty. It has the highest snow-capped peaks of the Caucasian mountains. Georgia contains valuable sulphur and other medicinal springs.

**Communications.**—Georgia had 1,410 km. of railways, in 1965. The 15 trunk line from Batumi through Tbilisi to Baku on the Caspian sea has several narrow-gauge branches on Georgian territory to the coal mines of Tkibuli, to the port of Poti (page 408), and also to the Armenian frontier. A railway line from Akhal to Senaki along the Black sea coast, through Sukhumi (page 404) to Tuapse, was completed in 1946.

20 *Charts 2214, 449.*

**BLACK SEA.—General remarks.**—The Black sea lies between the parallels of Lat.  $41^{\circ} 00' N.$  and  $46^{\circ} 30' N.$ , and between the meridians of Long.  $27^{\circ} 30' E.$  and  $41^{\circ} 45' E.$ , and is much restricted in the centre by the Crimea, a peninsula which extends southward from its northern 25 side. It is connected to the Ægean sea by the Bosphorus, Marmara denizi, and the Dardanelles, and to the Sea of Azov by Kerchenskiy proliv. By the latter connection it receives the drainage of a part of southern U.S.S.R., and by the former it discharges any surplus waters not lost by evaporation.

Compared with its own area, the area which drains into the Black 30 sea is very large, and hence the specific gravity of its surface layers, as compared with fresh water, is only 1,014 to 1,000. Close to the northern entrance of the Bosphorus the specific gravity near the bottom is 1,020.

The bottom in the central portion of this sea consists of bluish-grey or blue mud; near the coast it is mud mixed with shells, and, in places, 35 with sand and shingle.

Although the temperature of the surface changes with the seasons, at depths greater than 200 fathoms (365m8) it is fairly constant at  $48^{\circ} F.$

Marine life in the Black sea is very poor in comparison with that in the Mediterranean, and extends to a depth of about 100 fathoms (182m9) 40 only; below this depth, there is no life, and the water is charged with sulphuretted hydrogen. The reason for this is that the deeper layers of the Black sea are fed only by the saline under-current from the Mediterranean, passing through the Dardanelles, Marmara denizi, and the Bosphorus. The volume of water thus introduced annually into the Black 45 sea is a very small fraction of the total volume of water in that sea, so that, while the surface water is continually being renewed by river water and direct precipitation, the water at greater depths is only renewed, as a whole, once over an extremely long period of time, one estimate of this being 2,500 years. This water is, therefore, very deficient in oxygen.

50 Sturgeon and mackerel are caught in large numbers in the north-western part of the sea; herrings are found chiefly in Kerchenskiy proliv and off the mouths of River Danube and Reka Dnepr; the anchovy is caught in enormous quantities along the coast of the Crimea; and the flounder is found nearly all over the Black sea.

55 The shores of the Black sea are varied in aspect. On the south-western

*Charts 2214, 449.*

shore, from Rumeli lighthouse to Nos Kaliakra, in Bulgaria, the shore is of moderate height, backed by mountains, mostly of picturesque appearance; the coast thence, including the delta of River Danube, is low, slightly increasing in height towards the Crimea.

The eastern and southern shores, as well as the southern shore of the Crimea, are steep and notable for their considerable height, especially in the middle section of the Caucasian coast and in the eastern part of Anadolu (Anatolia). The northern shore of the Black sea has many estuaries and lakes which are partly separated from the sea and are quite salt.

**Rivers.**—The following are the principal rivers which discharge into the Black sea: On the west, River Danube and Reka Dnestr; on the north, Reka Yuzhnyy Bug and Reka Dnepr; on the east, Reka Kuban' by its southern branch, Reka Kodor, Reka Khopi and Reka Rion; on the south, Reka Chorokh and Kizilirmak.

*Charts 2429, 224, 1198.***REGULATIONS FOR PASSAGE OF VESSELS THROUGH THE DARDANELLES, MARMARA DENIZI AND THE BOSPORUS.—**

**1. The Montreux Convention.**—The following extracts are taken from the Convention regarding the Regime of the Straits, signed at Montreux on July 20th, 1936:—

Article 2.—In time of peace, merchant vessels shall enjoy complete freedom of transit and navigation in the Straits, by day and at night, under any flag and with any kind of cargo, without any penalties except as provided in Article 3 below. No taxes or charges other than those authorized for sanitary control stations, lighting and buoyage &c., shall be levied by the Turkish authorities on these vessels when passing in transit without calling at a port in the Straits.

In order to facilitate the collection of these taxes or charges merchant vessels passing through the Straits shall communicate to the officials at the stations referred to in Article 3 their name, nationality, tonnage, destination and last port of call (provenance).

Pilotage and towage remain optional.

Article 3.—All ships entering the Straits from the Ægean sea or from the Black sea shall stop at a sanitary station near the entrance to the Straits for the purposes of the sanitary control prescribed by Turkish law within the framework of the international sanitary regulations. This control, in the case of ships possessing a clean bill of health or presenting a declaration of health, testifying that they do not fall within the scope of the provisions of the second paragraph of the present article, shall be carried out by day and at night with all possible speed, and the vessels in question shall not be required to make any other stop during their passage through the Straits.

Vessels which have on board cases of plague, cholera, yellow fever, exanthematic typhus, or smallpox, or which have had such cases on board during the previous seven days, and vessels which have left an infected port within less than five days and nights shall stop at the sanitary stations indicated in the preceding paragraph in order to embark such sanitary guards as the Turkish authorities may direct. No tax or charge shall be levied in respect of these sanitary guards and they shall be disembarked at a sanitary station on departure from the Straits.

Article 4.—In time of war, Turkey not being belligerent, merchant vessels, under any flag or with any kind of cargo, shall enjoy freedom of transit and navigation in the Straits subject to the provisions of Articles 2 and 3.

*Charts 2429, 224, 1198.*

Article 5.—In time of war, Turkey being belligerent, merchant vessels not belonging to a country at war with Turkey shall enjoy freedom of transit and navigation in the Straits on condition that they do not in any way  
5 assist the enemy.

Such vessels shall enter the Straits by day and their transit shall be effected by the route which shall, in each case, be indicated by the Turkish authorities.

Article 6.—Should Turkey consider herself to be threatened with  
10 impending danger of war, the provisions of Article 2 shall nevertheless continue to be applied except that vessels must enter the Straits by day and that their transit must be effected by the route which shall, in each case, be indicated by the Turkish authorities.

Pilotage may, in this case, be made obligatory, but no charge shall  
15 be levied.

2. **Existing procedure.**—The existing procedure for vessels in time of peace is given hereunder in accordance with the information received in the Hydrographic Department on the subject, and is given without prejudice to the precise meaning of particular phrases in the Convention.  
20 In this description of procedure the term "Straits" includes the Dardanelles, Marmara denizi, and the Bosphorus.

3. **Landing regulations.**—No one is permitted to land at any place within the prohibited areas, the limits of which are given on the charts, except at the private landing stages of the quarantine stations at Çanakkale  
25 (page 90), Gelibolu (page 98) and Anadolukavağı ( $41^{\circ} 10' N.$ ,  $29^{\circ} 05' E.$ ). The landing stages at Seddülbahir (page 87), Kilya koyu (page 92) and Gelibolu must be used by persons wishing to visit the cemeteries at those places; persons wishing to visit Troy must land at Çanakkale and make the journey by day only, by way of Sarical.

4. **Quarantine and Customs regulations; Merchant vessels.**—**Signals.**—Merchant vessels proceeding from the Ægean sea to the Black sea, without touching at İstanbul ( $41^{\circ} 00' N.$ ,  $28^{\circ} 57' E.$ ) or other  
30 ports in the Straits, are not required to stop at Çanakkale as the quarantine vessel there goes alongside and issues a transit visa, free of charge, without stopping the vessel. For ships coming from the Black sea, and also in transit, such formalities are effected at Büyükdere (page 159).

Any vessel in transit through the Straits must fly the International Code flag "T" above the quarantine flag "Q".

Vessels with a clean bill of health may, after obtaining a transit visa  
40 at Çanakkale, proceed direct to the Black sea without further stoppage in the Straits.

A healthy ship coming from an infected port and having no medical officer on board is required to embark sanitary guards at Çanakkale or Büyükdere for the passage through the Straits.

45 The vessels described in Article 3, of the Montreux Convention, are required to stop at Çanakkale and Büyükdere in order to embark the sanitary guards; the guards must be disembarked at Büyükdere and Çanakkale.

In the event of a port in the Straits being infected, vessels in transit  
50 through the Straits may embark sanitary guards at Çanakkale or Büyükdere, and thus ensure obtaining pratique at their next port of call.

Merchant vessels proceeding to İstanbul and requiring berths in the Inner port should, through their agents, notify the port authorities at least 12 hours before their expected arrival; *see* pages 150, 153. |

55 All vessels arriving in Turkish ports must fly a Turkish flag at the foremast.

*Charts 2429, 224, 1198.*

Proceeding from the *Ægean sea* to *İstanbul* or a port in *Marmara denizi*, vessels are required to obtain pratique and embark a custom-house guard at *Çanakkale*. Should the weather not permit of the sanitary examination being carried out at *Çanakkale*, the signal Y F of the International Code of Signals is displayed at the flagstaff in front of the Health Offices by day, to indicate that vessels are to proceed to the control station outside the entrance to the Port of *Galata* to obtain pratique; at night the signal will be made by flashing lamp in the Morse Code. 5

Vessels proceeding from the *Black sea* to *İstanbul* or a port in *Marmara denizi*, are required to obtain pratique, and embark a customhouse guard, at *Büyükdere*. 10

After obtaining pratique any cases of sickness or death on board should be reported to the quarantine station giving pratique, the police and the Port Authorities. This also applies to vessels in transit. 15

Arrangements can be made for the issuing of free pratique during the night to all ships with a regular bill of health by advising the quarantine station to this effect before their arrival. Vessels without a regular bill of health cannot obtain free pratique by night.

At the control stations vessels are boarded by the Sanitary, Police, Customs and Port officials; the launch carrying these officials displays a green square flag with a red and white square inset. A vessel which has completed the control formalities should display flag "N" of the International Code of Signals and continue to display the same till clear of the Straits. No communication with the shore or other vessels may be effected until this signal is displayed. 20 25

Vessels, which do not wish to communicate with the shore, must keep the International Code flag "Q" flying throughout the passage of the Straits by day and hoist a red light by night; the same signal should be used in the event of a vessel having to stop off a quarantine station. 30

**5. Regulations concerning vessels of war.**—Light surface vessels, small vessels of war, and auxiliary vessels, enjoy freedom of transit through the Straits, provided such transit is begun during daylight, and are not required to stop for examination by the Turkish authorities.

Vessels of war in transit through the Straits must not, except in the event of damage or peril of the sea, remain therein longer than is necessary for them to effect the passage. 35

When effecting transit, the officer in command of a foreign naval force shall, without being under any obligation to stop, communicate to a signal station at the entrance to the Dardanelles or the Bosphorus the exact composition of the force under his orders. The signal station for the Dardanelles is *Çanakkale* and for the Bosphorus, *Büyük Liman*. The information should be transmitted by radio at a distance of 50 miles before entering the Straits, and when the vessels are within visible distance from the signal stations mentioned, they must indicate their names by the International Code of Signals. 40 45

Vessels of war which have on board cases of plague, cholera, yellow fever, exanthematic typhus or smallpox, or which have had such cases on board within the last seven days, and warships which have left an infected port within less than five days must pass through the Straits in quarantine and apply by the means on board such prophylactic measures as are necessary in order to prevent any possibility of the Straits being infected. 50

Except through stress of weather, damage or other urgent circumstances, foreign warships are not authorised to visit Turkish ports unless permission has previously been obtained. Warships visiting Turkish 55

*Charts 2429, 224, 1198.*

ports must comply with the local Sanitary, Customs and Port regulations so that warships visiting İstanbul or other ports in the Straits will be required to stop off Çanakkale or Büyükdere ( $41^{\circ} 09' N.$ ,  $29^{\circ} 03' E.$ )  
 5 in order to obtain pratique as stated above for merchant vessels. Warships which have suffered damage during passage through the Straits should at once report their position and nature of damage to the signal stations above-mentioned by wireless.

For full details regarding vessels of war, the Montreux Convention referred to on page 9 should be consulted.

**Pilotage.**—Pilotage through the Straits is not compulsory. *See* page 14.

Pilotage between Çanakkale and İstanbul, though not compulsory, is however, advisable. Owing to the number of vessels in transit, vessels requiring a pilot should give 24 hours notice in advance, by radio, to  
 15 Çanakkale, or in the case of west-bound vessels to Black sea signal stations. Pilots board off Çanakkale ( $40^{\circ} 09' N.$ ,  $26^{\circ} 24' E.$ ) (page 86).

Vessels from Marmara denizi for Haydarpaşa, İstanbul or Bosphorus embark a pilot from the Pilot station situated on Haydarpaşa Outer breakwater (page 149), in a position westward of the longitude of Ahirkapi  
 20 light ( $41^{\circ} 00' N.$ ,  $28^{\circ} 59' E.$ ).

For vessels proceeding from the Black sea southward, pilots are embarked off Fil burnu ( $41^{\circ} 12' N.$ ,  $29^{\circ} 07' E.$ ) (page 161). It is however advisable to request a pilot through signal stations situated at Rumeli burnu or Anadolu burnu, and then await the pilot northward of a line  
 25 joining Garıpcı burnu and Poyraz burnu (pages 161 and 162) in order, if necessary, to be able to turn seaward again or to anchor.

It is reported that passage through the Bosphorus without a pilot would present little difficulty during the hours of daylight except for heavy cross traffic in the vicinity of İstanbul and elsewhere, and the difference  
 30 in application of the Rule of the Road referred to below. At night, however, unless familiar with these waters, the services of a pilot are essential as a multitude of shore lights on both sides of the channel tend to obscure the navigational lights and are generally liable to cause confusion; in addition, vessels at anchor with low-power anchor lights may be  
 35 encountered.

Pilotage is compulsory in the Port of Galata and the Inner port at İstanbul for Turkish vessels exceeding 500 gross tons and all vessels of other nationalities exceeding 300 tons gross. *See* page 154 concerning tugs.

40 Pilotage is compulsory in İzmit Körfezi; the pilot is embarked off Darica ( $40^{\circ} 45' N.$ ,  $29^{\circ} 23' E.$ ); *see* pages 129, 130.

**Navigation rules.**—*The Dardanelles.*—In the Dardanelles, vessels should, in accordance with Rule 25 of the Regulations for Preventing Collisions at sea, keep to that side of mid-channel which lies on their *starboard*  
 45 side, taking care to make the sound signals in accordance with that rule when approaching the narrows off Çanakkale and the bend at Nara. *See* Chart 2429.

Vessels should also take every precaution to avoid meeting other vessels in the critical areas between Kilitbahir and Çanakkale, between Nara and  
 50 Kilya, and between Gelibolu and Çardak; and, when the current or weather is in their favour should, in these critical areas, give way to oncoming vessels by stopping or reducing speed.

Vessels are also advised to take a pilot; *see* above.

*The Bosphorus.*—Vessels navigating in the area limited to the south  
 55 by the line connecting Kizkulesi ( $41^{\circ} 01' N.$ ,  $29^{\circ} 00' E.$ ) to Ortakoy mosque and to the north by a line joining Tarabaya and Umur banks

*Charts 2429, 224, 1198.*

light-buoy should keep to the European side of the centre line of the navigable channel when proceeding to the northward, and to the Asiatic side when proceeding to the southward. *See also pages 152, 153, 162, and caution on chart 1198.*

**Speed of vessels.—General.**—In order to avoid damage to the coast and to small craft, all power-driven vessels must proceed at the slowest speed at which steerage can be maintained, when within the following areas:—

(a) *In the Dardanelles:*—Between a line drawn from Mehmetçik burnu to Kum burnu, and a line drawn from the town of Gelibolu to Çardak burnu.

On no account is a speed of 10 knots to be exceeded in the Narrows of the Dardanelles between a line joining Nara burnu and Kilya lighthouse, and the parallel of latitude passing through Kanlidere Burnu lighthouse ( $40^{\circ} 06' N., 26^{\circ} 22' E.$ ).

(b) *In the Bosphorus:*—Between a line drawn from Ahırkapı burnu ( $41^{\circ} 00' N., 28^{\circ} 59' E.$ ) to Haydarpaşa, and a line drawn from Büyükdere to Umuryeri liman.

A speed of 10 knots is never to be exceeded in the Bosphorus.

**Tankers and vessels carrying dangerous cargoes.**—Tankers, whether laden or empty, and vessels carrying dangerous cargoes may pass through the Bosphorus during daylight only. The minimum permitted distance between such vessels proceeding in the same direction is 5 cables.

Whilst waiting to make the passage, vessels from southward must not proceed eastward of the meridian of Ahırkapı Burnu light-structure (page 140); those from the Black sea must remain more than 3 miles northward of a line between Rumeli lighthouse (page 162) and Anadolu light-structure (page 161).

**Harbour regulations at ports within the Straits.**—Special regulations at various harbours within the Straits are to be found under the ports concerned as follows:—

*Gelibolu.*—Page 97.

*Tekirdag.*—Page 105.

*Siliviri liman.*—Page 107.

*Karabiga limani.*—Page 110.

*Erdek.*—Page 112.

*Bandırma limani.*—Page 122.

*Gemlik.*—Page 127.

*İzmit Körfezi.*—Vessels are prohibited from entering the gulf without prior permission from the Turkish Government. *See page 129.*

*Port of Haydarpaşa.*—Page 152.

*Port of İstanbul.*—Page 153.

*Chart 2214.*

**AREAS IN BLACK SEA DANGEROUS DUE TO MINES.—Nemedri.**—**Degaussing.**—Certain areas within the scope of this volume are dangerous due to mines. Details of these areas, together with the details of the established channels through them are to be found in *NEMEDRI*, issued by the Hydrographic Department, and in Admiralty Notice to Mariners No. 18 of the current year.

The Soviet Naval Command recommends that all ships sailing to Soviet ports in the Black sea should be degaussed or wiped.

Degaussing stations exist as follows:—

*Turkey*.—Fenerbahçe (page 147). Ranging. For all except very large ships.

*U.S.S.R.*—Odessa: Novorossiysk.

**NAVIGATION IN WATERS ADJACENT TO THE U.S.S.R.**—The latest U.S.S.R. charts and publications give only sufficient information for navigation to the ports open to international trade.

Admiralty charts and pilots, as they are corrected and revised, will in general only give the information provided by the U.S.S.R. Other navigational aids may exist and caution will be necessary to avoid the possibility of mistaken identification.

Admiralty List of Lights will give the latest available details, but it must be assumed that only those lights along the routes to ports open for international trade will be corrected from recent information, elsewhere the information may not be of recent date.

**PILOTAGE.—Turkish waters.**—See Regulations for the passage of vessels through the Dardanelles, Marmara denizi, and the Bosphorus, pages 9–13, and the cautions on pages 12 and 86 concerning navigation in Turkish territorial waters.

The following sound signals, on the whistle or siren, are used in Turkish waters:—

Pilot boat.—Two long and one short blasts.

Control boat.—Four long blasts.

Mail boat (at Büyükdere).—One long and one short blast.

**U.S.S.R. waters.**—Pilotage is compulsory for merchant vessels at all ports of the Union of Socialist Soviet Republics where pilot stations are established.

There are pilot stations at Odessa, Nikolayev, Kherson, Skadovsk, Sevastopol', Kerch', for Sea of Azov pilots, Zhdanov, and Reka Don.

The signals for a pilot are those laid down in the International Code of Signals; if a pilot is available the pilot flag will be displayed at the pilot look-out station, otherwise a ball will be displayed.

Regions of compulsory and optional pilotage, together with points of embarkation and disembarkation of pilots, are published in U.S.S.R.

Notices to Mariners, Sailing Directions and Port Decrees.

The State sea pilots carry out the following duties:—

(a) The bringing in of ships.

(b) The taking of soundings.

(c) The observing of the state and accuracy of channels.

(d) Noticing that, while bringing in ships, no photographs of the approaches to the place are taken and that no soundings in the fairway are taken by any apparatus other than the hand lead.

The pilots carry out their duties by day or night, except when, as the result of darkness, fog, snow storms or unfavourable weather it is impossible to pilot the ship.

Pilots are forbidden to communicate to strangers descriptions or particulars of the fairway.

The pilot must repair on board immediately he is summoned by the master. The master must take all measures for the quick and safe reception of the pilot and for the preservation of his own ship.

The pilot is forbidden without the consent of the master, to leave the ship before he has brought her to a safe place, or taken her out to the open sea or handed over to another pilot.

The presence of the pilot on board does not relieve the master from the responsibility for the navigation of the vessel.

Should the master leave the bridge he must point out to the pilot who is responsible for the navigation of the vessel during his absence.

**REGULATIONS AFFECTING VESSELS NAVIGATING IN U.S.S.R. PORTS.**—**Merchant vessels calling at ports of the U.S.S.R.** 5  
—Merchant vessels coming from abroad are permitted to call only at one of the recognised ports of entry where customs stations are established.

The U.S.S.R. ports of entry are:—

*Danube.*—Reni, Izmail, Kiliya (Chilia). 10

*Black sea.*—Belgorod-Dnestrovskiy, Il'ichevsk, Odessa, Kherson, Novorossiysk, Tuapse, Poti, Batumi.

*Sea of Azov.*—Zhdanov, Berdyansk.

Vessels of the U.S.S.R. Police department wishing to stop vessels will hoist, by day, the relevant signal of the International Code, and 15  
by night, two *green* lights, disposed vertically, above the masthead light.

Any vessel to which this signal is made must stop and not proceed until permission to do so has been given by the police vessel.

It may occasionally be necessary to prohibit the entry of shipping into certain U.S.S.R. territorial waters. In these circumstances an Examination 20  
service, carried out by special examination vessels, guardships and coastguard stations will be established. Mariners are therefore warned on approaching these territorial waters to keep a good look out for any examination service vessel or coastguard station, which will show the following signals:— 25

*By day:* A blue triangular flag.

*By night:* Three *blue* lights, disposed vertically, hoisted at the peak.

Should entry into, or navigation within any given area be prohibited, the examination vessels, guardships, or coastguard stations engaged in 30  
carrying out the examination service, will, in addition to the distinguishing signals described above, show the following signals:—

*By day:* Three red balls, disposed vertically.

*By night:* Three *red* lights, disposed vertically.

Should entry to, or navigation within be not prohibited for any given area, and no special signal or instruction regarding further movements 35  
be made or given by the examination service vessels, guardships or coastguard stations, an in-coming vessel is free to proceed to her destination, but she must observe such regulations as may already have been promulgated.

Should U.S.S.R. vessels of war be present in any such area, and should 40  
no special regulations concerning navigation within it have been promulgated, then Masters of in-coming vessels must not pass between such vessels of war.

**Quarantine.**—Before entering a port vessels arriving from abroad must display one of the quarantine signals given in the International 45  
Code of Signals. The quarantine flag must be displayed until pratique has been given by the Quarantine officer, when it must be hauled down.

After the quarantine flag has been hauled down, the various Government and Port officials, also the Agent for the vessel, will come on board, otherwise no one should be allowed to come on board or leave the vessel 50  
until the Customs examination is completed.

**Vessels passing dredgers in U.S.S.R. waters.**—**Signals.**—The following regulations are in force for vessels passing dredgers in U.S.S.R. waters:—

(1) Every steam or motor vessel, when passing a dredger at work in 55



channels, narrows, anchorages or off wharves and piers, must give timely warning of her approach by means of one prolonged sound signal (4-6 seconds), meaning enquiry about the possibility of passing; on hearing this signal the dredger must confirm by sound signal the side which is free for passage, or that which is occupied, according to the following system:—

- One long . . . Go to the right of the channel.
- Two long . . . Go to the left of the channel.
- Three long . . . Passage closed, await clearance.

10 In the event of no answering sound signal from the dredger, the ship must assume that the passage is closed on both sides and must wait for it to be freed.

Ships must pass a dredger at the minimum speed for steerage way.

(2) Vessels passing, or about to pass a dredger, are forbidden to over-  
15 take one another.

(3) No vessel passing a dredger is to tow astern a hawser or chain on the bottom; nor may she have an anchor apeak.

(4) A dredger at work in any channel or fairway must display the following signals on that side of her on which work is proceeding and on  
20 which vessels must *not* pass:—

*By day:* A black ball over or under a cone, point up.

*At night:* Two *red* lights, disposed vertically, and visible at least two miles.

4a. The dredger must display the following signal on the side on which  
25 vessels may pass:—

Two *green* lights disposed vertically and visible at least 2 miles.

(5) In the event of there being no safe passage on either side of a dredger, at work she will show the signals mentioned in 4, above, on both sides of her.

30 (6) A dredger in any channel, fairway or other area in which there is no room for a vessel to manoeuvre, which is about to shift her position must, as soon as she begins to weight her anchors, show the signals mentioned in 4, above, on both sides of her.

(7) A dredger, as soon as she gathers way after weighing, must haul  
35 down the above-mentioned signals and thereafter she is subject to the same regulations as any other vessel under way.

U.S.S.R. dredgers display a white pendant with a central horizontal light-blue stripe; near the centre of the pendant is a red star within a white circle having a light-blue border. *See* page 18.

40 **ICE-BREAKERS.—U.S.S.R.**—The request for the conducting of vessels through ice must be made, in port, to the Harbour Master, or, at sea, to the Master of the ice-breaker.

(2) Every vessel to be conducted must have a sufficiency of fuel and provisions, timber, quick-setting cement, plaster, mats, etc.; the ship's  
45 pumps must be in good condition, and the vessel must be fitted with radio.

Failing these conditions, and also if the vessel has no clearing orders or evidence of suitability to sail, the Harbour Master, or at sea the Master of the ice-breaker, has the right to refuse to take the ship to sea or to  
50 bring her into port, respectively.

(3) Every vessel requiring the assistance of an ice-breaker must await the arrival of the latter before entering the ice.

(4) The time and order of vessels following through the ice, or the time if only one vessel is going, is determined by the Harbour Master,  
55 if in port, or by the Master of the ice-breaker, if at sea.

(5) Masters of vessels following an ice-breaker through ice must act in accordance with the orders of the Master of the ice-breaker, with respect to their movements.

(6) Vessels following an ice-breaker may not overtake one another.

(7) Vessels following an ice-breaker must be ready to go full speed astern immediately. 5

(8) Vessels being towed through ice must not use their engines for going ahead without a definite order from the Master of the ice-breaker. They must at all times be ready to cast off the tow on instructions from the Master of the ice-breaker, and also to go full speed astern. 10

(9) Priority is given to (1) warships, (2) mail and/or passenger ships, and (3) cargo vessels concerning whose freights special dispositions of urgency have been issued. Other vessels proceed in the order of their time of arrival at the edge of the ice or of their readiness to leave port.

(10) In the event of damage to a vessel following an ice-breaker, the damaged vessel must make the distress signals prescribed by the International Code of Signals. 15

(11) Vessels following an ice-breaker must be guided by the signals, given below, made by whistle or siren. The signals, except No. 6, must be repeated by each ship in turn, beginning with the one nearest the ice-breaker or vessel making the signal. 20

The instructions of the ice-breaker, given by these signals, must be obeyed immediately by the vessels addressed.

(12) If the orders of the Master of the ice-breaker are not carried out by the Master of a vessel under escort, the Master of the ice-breaker has the right to refuse to escort the latter vessel any farther until his instructions have been executed. 25

(13) Neither the ice-breaker nor the owner of the ice-breaker nor the charterer is responsible for damage or loss liable to be caused to the vessel conducted while being escorted through the ice. 30

(14) Merchant vessels of all flags may use gratuitously the services of the ice-breakers of the relevant port authorities for escort from the edge of the ice into port, from the port to sea, and within the limits of the port; and also the towrope when its use is deemed necessary by the Master of the ice-breaker. 35

The mooring of ships for loading and unloading operations, bunkering, docking, etc., is done for payment as for the use of towropes, etc.

(15) Every vessel making use of an ice-breaker for passing through ice, must submit to directions according to these regulations.

(16) The captain of a ship following an ice-breaker must calculate and known the co-ordinates of his own ship and the position of leaving the ice-breaker. 40

**International Icebreaker signals.—See below.**

**SIGNALS.—International Icebreaker signals.**—By single-letter signals, when made between an icebreaker and assisted vessels, have only the significations given in this table and are only to be made by sound, visual signals or radiotelephony. 45

The use of these single-letter signals is introduced and finished, respectively, by the following two letter groups:—

W.M. = Icebreaker support is now commencing. Use special ice-breaker support signals and keep continuous listening watch for sound, visual and radiotelephony signals. 50

W.O. = Icebreaker support is finished. Proceed to your destination.

<i>Code letters or figure</i>	<i>Ice-breaker</i>	<i>Assisted vessel(s)</i>
G — — .	I am going ahead: follow me.	I am going ahead: I am following you.
A . —	Go ahead (proceed along the ice channel.)	I am going ahead (I am proceeding along the ice channel.)
J . — — —	Do not follow me (proceed along the ice channel.)	I will not follow you (I will proceed along the ice channel.)
Q — — . —	Shorten the distance between the vessels.	I am shortening the distance.
B — . . .	Increase the distance between vessels.	I am increasing the distance.
P . — — .	Slow down.	I am slowing down.
N — .	Stop your engines.	I am stopping my engines.
H . . .	Reverse your engines.	Reverse your engines.
L . — . .	You should stop your vessel instantly.	I am stopping my vessel.
4 . . . . —	Stop. I am ice-bound.	Stop. I am ice-bound.
5 . . . . .	Attention.	Attention.
Y — . — —	Be ready to take (or castoff) the tow line.	I am ready to take (or cast off) the low line.

*Notes.*—(1) The signal K (— . —) by sound or light may be used by an icebreaker to remind ships of their obligation to listen continuously on their radio.

(2) If more than one vessel is assisted, the distances between vessels should be as constant as possible: watch speed of your own vessel and vessel ahead. Should speed of your own vessel go down, give "Attention" signal to the vessel following.

(3) The use of this table does not relieve Masters of the duty of complying with Rules 15 and 28 of the International Regulations for Preventing Collisions at Sea.

(4) The signal (. . — . .) by sound and/or light may be used by an icebreaker only to stop the headway of a ship in an ice channel ahead of and approaching or going away from the ice-breaker.

*Single-letter signals which may be used during ice-breaking operations.*

*E .	I am altering my course to starboard.
*I . .	I am altering my course to port.
*S . . .	My engines are going astern.
*M — —	My vessel is stopped and making no way through the water.

*Note.*—Signals of letters marked \*, when made by sound, may only be made in compliance with the requirements of the International Regulations for Preventing Collisions at Sea.

**Flag displayed by dredgers.**—See page 16.

**Storm signals.**—The places where visual storm signals are shown will be found noted against them in the body of this volume. Full information concerning storm warnings and other meteorological information broadcast by radio is given in the Admiralty List of Radio Signals, Volumes III and V.

**Turkish storm signals.**—Turkish day and night storm signals Nos. 1-4 and 13-14 are similar to the U.S.S.R. storm signals of those numbers described below.

The signal for a gale of hurricane force, from any direction, is a black cross by day, or three lights, *red, green, red*, disposed vertically, at night.

The signal for a wind of force 6 to 7, from any direction, is one black ball by day, or a *white* light above a *green* light at night.

**U.S.S.R. Storm signals.**—In accordance with the Lisbon International Agreement of 23rd October, 1930, the following signals have been adopted for use in waters of the U.S.S.R. to indicate the weather expected. 5

No.	Day	Night	Signification
1	Black cone, point, up.	Two <i>red</i> lights, vertical.	Wind force 8 or over, from N.W.
2	Black cone, point down.	Two <i>white</i> lights, vertical.	Wind force 8 or over, from S.W.
3	Two black cones, points up.	<i>Red</i> light over <i>white</i> light.	Wind force 8 or over, from N.E.
4	Two black cones, points down.	<i>White</i> light over <i>red</i> light.	Wind force 8 or over, from S.E.
5	One black ball.	One <i>red</i> light.	Wind force 6-7.
6	Two black balls, vertical.	Two <i>red</i> lights, horizontal.	Heavy squall.
7	One black cross.	Four <i>red</i> lights, at the angles of a diamond.	Hurricane.
8	One black T over another inverted.	One <i>green</i> light.	Wind force 5 or over.
9	One black T, inverted.	Three <i>red</i> lights, at the angles of a triangle, point up.	Wind force 6-7, from N.W.
10	One black T.	Three <i>red</i> lights, at the angles of a triangle, point down.	Wind force 6-7, from S.W.
11	Two black T's inverted, vertical.	One <i>red</i> light over No. 9.	Wind force 6-7, from N.E.
12	Two black T's, vertical.	One <i>red</i> light under No. 10.	Wind force 6-7, from S.E.
13	One black flag or one black cylinder.	By day only.	Wind expected to veer.
14	Two black flags or two black cylinders, vertically disposed.	By day only.	Wind expected to back.
15	Two black horizontal bars, vertical.		Weather predicted for to-morrow.
16	One black horizontal bar.		Weather predicted for today.

**Notes.**—(1) Signal No. 8 is hoisted only in those regions which are much frequented by small vessels and fishing craft, for which a wind of force 5 is dangerous.

(2) Such regions are determined by the local directorate of the hydro-metric service, in conjunction with the Ministry of Fisheries, etc., subject to confirmation by the Hydrographic Department of the Soviet Navy. 10  
In no other region is signal 8 hoisted.

(3) Signals Nos. 9-12 may be hoisted in conjunction with signals Nos. 5, 6, 7 and 8.

(4) Signals Nos. 13 and 14 are hoisted only in conjunction with one of signals Nos. 1-4. 15

(5) The height and diameter of the cones and cylinders, the diameter of the balls, and the length and breadth of the flags and of the strips forming the T's must not be less than  $3\frac{1}{2}$  feet (1m0). The distance between two objects of the day signals, Nos. 3, 4, 6, 8 and 14, or between the lights of the night signals, Nos. 1, 2, 3, 6 and 7, must not be less than  $3\frac{1}{2}$  or  $6\frac{1}{2}$  feet (1m0 or 2m0), respectively. 20

(6) Signals Nos. 5, 6, 7 and 8 are hoisted at the masthead, signals Nos. 1, 2, 3, 4, 13 and 14 at the yard arm.

(7) Signals Nos. 9, 10, 11 and 12 may also be used to indicate expected winds of force 5.

- 5 (8) If a wind of force 6-7 is expected, signal No. 5 is hoisted in conjunction with one of the signals Nos. 9-12. If a wind of force 5 is expected signal No. 8 is hoisted in conjunction with one of the signals Nos. 9-12.

- (9) In the event of a further unexpected increase of wind force to 8 or more, signals Nos. 5, 8 and 9-12 are replaced, as requisite, by signals 10 Nos. 1-4, 6 or 7.

(10) Signals Nos. 7 and 8 may be hoisted in conjunction with signals Nos. 9-12.

- (11) The maximum width of day signals Nos. 9-12 should be  $4\frac{1}{2}$  feet (1m5), the height of day signals Nos. 9-12 and between the separate parts 15 of day signals Nos. 11 and 12 should be  $4\frac{1}{2}$  feet (1m5), as should the distance between the component parts of night signals Nos. 9-12.

(12) Signals Nos. 9-12 are hoisted at the yard arm.

(13, 14) Signals Nos. 15 and 16 may be hoisted in conjunction with any of the signals Nos. 1-12.

- 20 (15) If signals Nos. 15 and 16 are not hoisted, the weather indicated by one of the signals Nos. 1-12 may be expected within the next 48 hours, no nearer approximation being possible. As soon as the commencement can be predicted with greater accuracy the appropriate signal time will be hoisted.

- 25 (16) Time signals are not made at night, and if hoisted are hauled down when the night signals replace the day signals.

- (17) If signal No. 15 has been hoisted, and no further instructions have been received by the time when the night signals are replaced by the day 30 signals on the following morning, signal No. 16 will be hoisted in place of No. 15.

(18) The length of the bars in signals Nos. 15 and 16 must not be less than  $4\frac{1}{2}$  feet (1m5), nor their width nor the spaces between them, less than  $1\frac{1}{2}$  feet (0m5).

- 35 (19) Signals Nos. 15 and 16 are hoisted at the yard, alongside Nos. 1-4 or 8-12, or else between those signals and the mast.

(27) Storms warnings are also transmitted by Radio, *see* Admiralty List of Radio Signals, Vol. III.

(30) Day signals are replaced by night signals, and vice versa, at sunset and sunrise, respectively.

- 40 **Traffic signals.**—Traffic signals for vessels entering or leaving a harbour, or the channels leading to a harbour, in the U.S.S.R. are as follows, the balls, cylinders, cones or lights being disposed vertically in every case, and the balls, cylinders and cones being black:—

<i>Day</i>	<i>Night</i>	<i>Signification</i>
Three balls.	Three <i>red</i> lights.	Channel closed (due to obstruction.)
A cone, point up, between two balls.	A <i>white</i> light between two <i>red</i> lights.	Entry temporarily prohibited.
A cone, point down, over a cone, point up, over a ball.	A <i>green</i> light, over a <i>white</i> light, over a <i>red</i> light.	Channel temporarily closed.
A cone, point up, between two cones, points down.	A <i>white</i> light between two <i>green</i> lights.	Exit temporarily prohibited.
A ball between two cylinders.	A <i>red</i> light between two <i>white</i> lights.	movement in harbours by small craft prohibited.

**U.S.S.R. warning signals to denote the presence of submarines**  
Vessels of the U.S.S.R. Navy fly one of the two International Code groups or OIY, to denote that submarines, which may be submerged, are in the vicinity.

In addition, when possible, the escorting vessel will transmit by radio the signal ALZIV - ISCQU, meaning "Direct your attention to submarines," or by radiotelephone on the international wavelength of 600 metres.

Vessels are cautioned to give a wide berth to any vessel flying this signal. If from any cause it is necessary to approach her, vessels should proceed at slow speed until the signal is lowered or instructions are given her as to a safe course to steer. A good lookout should be kept meanwhile for submarines, whose presence may be only indicated by their periscopes showing above water.

It must not be inferred from the above that submarines exercise only when in company with escorting vessels.

Information concerning U.S.S.R. submarines is similar to that given in Admiralty Notice to Mariners No. 8 of the current year.

U.S.S.R. submarines on the surface at night carry only one steaming light, on the superstructure from 11 to 15 feet (3m4 to 4m6) above the deck.

When U.S.S.R. submarines are surfacing at night, they may exhibit navigation lights, and stream a buff exhibiting a *white* fixed light before doing so.

The presence of a U.S.S.R. submarine at night may be indicated by a coloured rocket fired from underwater.

The indicator buoys which a sunken U.S.S.R. submarine may release to indicate its position are each painted red and white in sectors and exhibit a *white quick-flashing light*.

**Turkish submarines.—General.**—Information concerning Turkish submarines is, in general, similar to that given in Admiralty Notice to Mariners No. 8 of the current year.

**U.S.S.R. depth signals.**—The following depth signals are shown at Ochakov, Nikolayev, Kerch', the pilot station on Reka Don, and Rostov, and indicate the height of the level of the water above the chart datum. The signals indicate units of 20 centimetres (about 8 inches) in the following manner:—

Each unit (about 8 inches)	}	<i>by day.</i> —a black cone, point down	
in one or more vertical hoists		<i>at night.</i> —a <i>green light</i>	
Each half unit (about 4 inches)	}	<i>by day.</i> —a white cylinder	40
either below the unit signal or on the port side, from seaward, of it		<i>at night.</i> —a <i>red light</i>	
Every five units (about 3½ feet)	}	<i>by day.</i> —a black cylinder	
disposed vertically, on the starboard side, from seaward, of the unit signal		<i>at night.</i> —a <i>red light</i>	45
Every twenty-five units (about 16½ feet)	}	<i>by day.</i> —a black ball	
disposed vertically, at the starboard yard-arm, from seaward		<i>at night.</i> —a <i>white light</i>	50

**Flag displayed by vessels engaged in surveying.**—U.S.S.R. vessels, when engaged in surveying operations, fly a blue triangular flag with a rounded point to the fly, having a white circular disc bearing the figure of a lighthouse.

**U.S.S.R. danger warning signals.**—U.S.S.R. light-vessels, when a vessel is observed to be standing into danger, display the signal "J.D." of

the International Code of Signals and fire rockets *every minute*, until the vessel observes the signal. At night only the rockets are used.

**U.S.S.R. examination service.**—There may be occasions when navigation is restricted, or prohibited, in U.S.S.R. territorial waters; should this  
5 be the case an examination service will be operated by special vessels, guard-ships or coastguard stations, which will show a distinguishing signal consisting of a blue triangular flag, by day, and three *blue* lights, disposed vertically, at night.

Should navigation be absolutely prohibited, within a particular area,  
10 the examination vessel, guard-ship or coastguard station will show, in addition to the distinguishing signal, three red balls, disposed vertically, by day, and three *red* lights in a similar position, at night.

**UNIFORM SYSTEM OF BUOYAGE.**—See N.P.100—*The Mariners' Handbook*.

15 **Turkish buoyage system.**—**Caution.**—The Turkish Government has accepted in principle the new International Uniform System of Buoyage, described in *N.P.100*, but it is probable that in all Turkish waters the complete change over to the new system may take some time to complete. Admiralty publications are being amended as the information is received.  
20 **Mariners are warned that both the old and the new systems may be met with in Turkish waters for some time to come.** The body of this volume should invariably be consulted for all details of buoyage at particular places. The latest information received is that the Lateral system is being applied, the following rules being adopted:—

25 The starboard side of a channel is, or will be marked by black conical buoys with or without conical topmarks.

The port side of a channel is, or will be marked by red can buoys with or without can topmarks.

In the Dardanelles the Asiatic side is considered the starboard side and  
30 the light-buoys, if any, exhibit *green* lights; the European side is considered the port side and the light-buoys, if any, exhibit *red* lights.

In the Bosphorus, the European side is considered the starboard side and the light-buoys exhibit *green* lights; the Asiatic side is considered the port-side and the light-buoys exhibit *red* lights.

35 **Bulgarian Buoyage System.**—The system of buoyage adopted by the Bulgarian Government is similar to the U.S.S.R. New Buoyage System, described below, with certain minor differences.

**U.S.S.R. Buoyage system.**—A modified Uniform System of Buoyage is in use in the waters of the U.S.S.R. The Cardinal system is employed in  
40 the marking of navigational dangers in the open sea or near the coast, and also to mark mined areas, spoil grounds, prohibited areas, exercise areas, and fishing tackle or fishing grounds. The Lateral system is employed to mark channels and fairways.

The following features are common to both systems:—

45 (a) The shape of a buoy has no significance, but where known is charted. Buoys may carry a superstructure.

(b) Topmarks may be fitted to buoys and spar buoys; the topmark is placed on the top of the spar, except in the case of a spherical topmark which is placed slightly below the top.

50 (c) One or two additional spherical topmarks, painted the same colour as the buoy, may be added to distinguish similar buoys near one another.

(d) Buoys may be equipped with some form of fog signal.

55 (e) Buoys and spar buoys may be fitted with a reflector, and/or a radar reflector.

# U.S.S.R. BUOYAGE SYSTEM

## LATERAL SYSTEM

### FAIRWAY AND CHANNEL MARKING



Port Side



Starboard Side



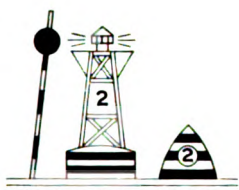
Port Side Turning



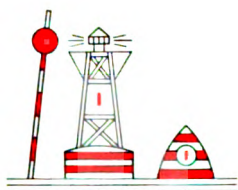
Bifurcation & Junctions



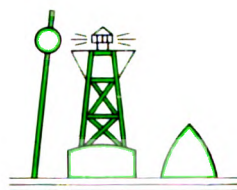
Starboard Side Turning



MID CHANNEL MARKS  
Channel Axis



Turning Axis



WRECK  
MARKING

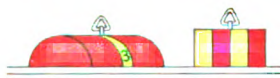
### MISCELLANEOUS MARKS



Submarine Cable  
Areas



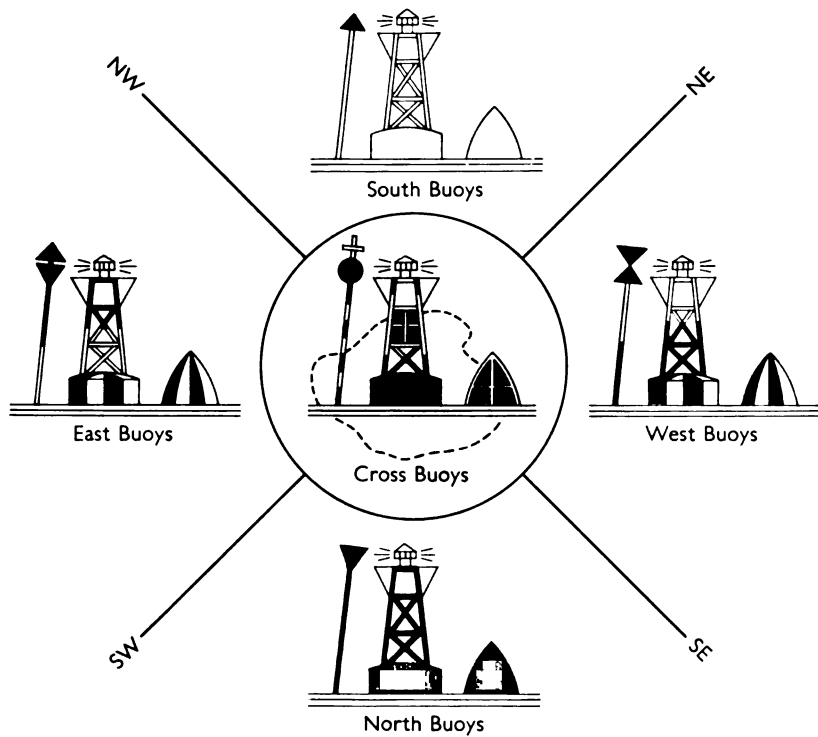
Quarantine Anchorages



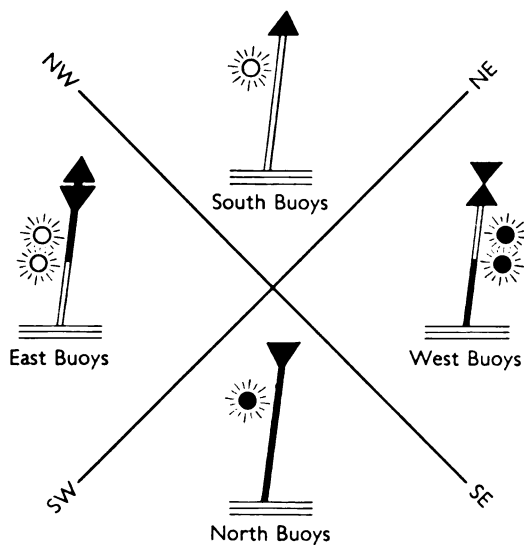
Anchorages



# CARDINAL SYSTEM DANGER MARKING



## MARKING OF FISHING GROUNDS



(f) Where buoys are numbered, the number is either painted on the buoy or on a plate fixed to the superstructure.

**The Cardinal system.**—Buoyage in accordance with the Cardinal system is as follows:—

*North buoy*, to be left to the north, marks the southern side of a danger: 5  
buoys, superstructure if fitted, and spar buoys, are painted red: topmark, a red cone, point down: light-buoys exhibit a *red flashing light every five seconds*.

*East buoy*, to be left to the east, marks the western side of a danger: 10  
buoys are painted black and white in stripes: superstructure, if fitted, and spar buoys are painted upper half, black, lower half, white: topmark, two black cones, bases together: light-buoys exhibit a *white flashing light every two and a half seconds*, or a *white group flashing light showing two flashes every five seconds*.

*South buoy*, to be left to the south, marks the northern side of a danger: 15  
buoys, superstructure if fitted, and spar buoys, are painted white: topmark, a black cone, point up: light-buoys exhibit a *white flashing light every five seconds*.

*West buoy*, to be left to the west, marks the eastern side of a danger: 20  
buoys are painted red and white in stripes: superstructure, if fitted, and spar buoys are painted upper half, white, lower half, red: topmark, two red cones, points together: light-buoys exhibit a *red flashing light every two and a half seconds*, or a *red group flashing light showing two flashes every five seconds*.

*Cross buoy*, which may be passed on either hand, marks a small isolated 25  
danger: buoys are painted red with one white horizontal band and four white vertical stripes, one on each side: buoys with a superstructure are painted red, the superstructure being red and white in bands and having, on each side, a red plate with a white cross: spar buoys are red and white in bands: topmark, a red sphere surmounted by a white cross: light-buoys exhibit a *green flashing light every three seconds*. 30

*Fishing tackle or fishing grounds* are marked by spar buoys, with topmarks, similar to those described above. If lighted, they exhibit lights as follows:—North buoy, one *red fixed light*; East buoy, two *white fixed lights*, 35  
disposed vertically; South buoy, one *white fixed light*; West buoy, two *red fixed lights*, disposed vertically.

**The Lateral system.**—With the Lateral system, the sides of channels and fairways are marked by starboard-hand and port-hand buoys, to be left on the mariner's starboard or port side, respectively, when entering from seaward; buoys with different markings and light characteristics are 40  
used at bends in a channel. There are also buoys to mark the axis of a channel or a recommended track, and the bifurcation of a channel or the junction of two channels.

Isolated dangers in a channel are marked by Cross buoys, as described under the Cardinal system above. 45

Where buoys are numbered, starboard-hand buoys carry odd numbers, port-hand buoys, even numbers; numbering is in sequence from a harbour to seaward.

*Starboard-hand buoy*, marking straight sections of a channel: buoys, superstructure if fitted, and spar buoys, are painted black: topmark, a 50  
black cone, point up: light-buoys exhibit a *white flashing light every three seconds* or a *white group flashing light showing two flashes every six seconds*.

*Starboard-hand turning buoy*, marking a bend in a channel: buoys are painted black with one white band: superstructure, if fitted, and spar 55  
buoys are black with a broad white band: topmark, a black cone, point

up: light-buoys exhibit a *white flashing* light *every one and a half seconds*, or a *white group flashing* light showing *two flashes every three seconds*.

*Port-hand buoy*, marking straight sections of a channel: buoys, superstructure, if fitted, and spar buoys, are painted red: topmark, a black cone, point down: light-buoys exhibit a *red flashing* light *every three seconds*, or a *red group flashing* light showing *two flashes every six seconds*.

*Port-hand turning buoy*, marking a bend in a channel: buoys are painted red with one white band: superstructure, if fitted, and spar buoys are red with a broad white band: topmark, a black cone, point down: light-buoys exhibit a *red flashing* light *every one and a half seconds*, or a *red group flashing* light showing *two flashes every three seconds*.

*Mid-channel buoy*, in straight sections of a channel, marking the centre-line of the channel or a recommended track; buoys and spar buoys are painted black and white in bands: superstructure, if fitted, is white: topmark, a black sphere: light-buoys exhibit a *white flashing* light *every five seconds*. (Note.—These buoys may also be used as Landfall marks.)

*Mid-channel turning buoy*, marking a turning point in a channel or on a recommended track: buoys and spar buoys are painted red and white in bands: superstructure, if fitted, is white: topmark, a red sphere: light-buoys exhibit a *red flashing* light *every two seconds*, or a *red group flashing* light showing *two flashes every four seconds*.

*Bifurcation and Junction buoy*, marking the division of a channel or the junction of two channels: buoys are painted black and red in stripes: superstructure, if fitted, is red with a broad black band: spar buoys are painted black and red in bands: topmark, a black and red sphere: light-buoys exhibit a *white flashing* light *every six seconds*.

*Miscellaneous marks*.—*Wreck marking* buoys, superstructure, if fitted, and spar buoys, are painted green: topmark, a green sphere: light-buoys exhibit a *green flashing* light *every five seconds*, or a *green group flashing* light showing *two flashes every ten seconds*.

*Submarine cable* buoys mark the limits of areas in which anchoring is prohibited on account of submarine cables: buoys are painted black and yellow in stripes: superstructure, if fitted, is black with a broad yellow band: spar buoys are painted black and yellow in bands: topmark, a black square flag: light-buoys exhibit an *orange isophase* light *every two seconds*.

*Anchorage* buoys, marking the limits of designated anchorage areas, are painted red and yellow in stripes: superstructure, if fitted, is yellow: spar buoys are painted red and yellow in bands: topmark, a red and yellow square flag, divided diagonally: light-buoys exhibit an *orange flashing* light *every three seconds*. Mooring buoys are painted red and yellow in stripes if can-shaped, or red with a yellow band if barrel-shaped.

*Quarantine* buoys, the superstructure if fitted, and spar buoys, marking the limits of a quarantine anchorage, are all painted yellow: topmark, a yellow square flag: light-buoys exhibit an *orange flashing* light *every five seconds*. Mooring buoys for quarantine purposes are painted yellow.

#### U.S.S.R. NAVIGATIONAL AIDS OTHER THAN BUOYS.—Lights.

—During the winter, the shore lights of the Black sea and Sea of Azov will cease to function as soon as the whole visible horizon therefrom shall be covered with solid ice. The lights will again be exhibited as soon as open spaces are seen, or when the ice appears to begin to move; should a vessel be seen at that time, even if the movement of the ice be arrested, the lights will not be discontinued, unless the crew have abandoned the vessel and communication cannot be effected.

When lights cease to exhibit in the winter, notification will be given in the *Ubeko* (Department for ensuring safety of shipping) notification to Mariners

and the circulars of the Hydrographic Department (Notices to Mariners). When icebreakers are working, lights will be exhibited throughout the winter.

**Light vessels.**—Light-vessels in U.S.S.R. waters remain on their stations during the period of navigation only; by day they show a ball over a yellow flag with a blue St. George's cross, and at night they exhibit a riding light. Danger warning signals, *see* page 21. 5

**Fog bells.**—Fog bells at U.S.S.R. lighthouses and light-vessels are sounded unless otherwise stated, in the following uniform method:—

(a) At lighthouses.—In groups of *double* strokes, the interval between the groups being not more than *three minutes*. 10

(b) On board light-vessels.—In groups of *triple* strokes, the interval between the groups being not more than *two minutes*.

When the fog signal of an approaching vessel is heard, the intervals between the double and the triple strokes in the groups are reduced, and the bell is sounded continuously in double or triple strokes until the vessel is past the light or clear of danger. 15

**LIFE-SAVING.**—For the latest information on life-saving, *see* N.P. 100—*The Mariners' Handbook*.

**Life-saving stations.**—Life-saving stations are maintained at the places given below. Those stations at places marked with one asterisk are equipped with one or more lifeboats, and those marked with two asterisks, with a line-throwing apparatus in addition; those stations with no asterisk against them are equipped with a line-throwing apparatus only. 20

**Turkey.**—The life-saving service at the Black sea entrance of the Bosphorus extends from a position about 26 miles westward of the entrance to a position about 21 miles eastward of it. The stations comprising this service are given below, and have special identification marks described on page 164. 25

<i>Western side of entrance</i>	<i>Eastern side of entrance</i>
Rumeli lighthouse, three-quarters of a mile westward of	Yom burnu
*Kilyos	*Riva
Kısırkaya	Kelagra burnu
Moloz burnu	Adacıklar burnu
Akpınar	Kara burnu
Kunduz beacon	Alacalı point, eastern side of
*Karaburun	*Sile burnu
Karaburun, 5 miles north-westward of	Cebeci iskele
	*Kefken adası

**Rumania.**—

\*\*Constanța

**U.S.S.R.**—

**Black Sea.**—

- \*Lyustdorf
- \*Bol'shoy Fontan
- \*Mys Lanzheron
- \*Odessa
- \*Severnnyy Odesskiy mys, 1½ miles westward of, open only during summer
- \*Dofinovka
- \*Ochakovskiy mys
- \*Nikolayev

- \*Yevpatoriya
- Sevastopol', Pavlovskiy mys
- \*Sevastopol', Artilleriyaska bukhta, open only during summer
- \*Yalta
- \*Gurzuf
- \*Mys Sudakskiy
- \*Gelendzhik
- \*Sochi
- \*Batumi

**Kerchenskiy proliv.**—

- Mys Pavlovskiy
- Mys Yenikale
- Kerch'

**Sea of Azov.**—

- Berdyanskaya kosa
- Zhdanov
- Strelka, Krivaya kosa

- Kosa Zolotaya
- Novo-Mar'inakiy
- Mys Petrushin
- Taganrog
- Yeysk
- Sazal'nikakaya kosa
- Port Azov

**LOCAL MAGNETIC ANOMALY.**—A local magnetic anomaly is reported to exist in the following areas:—In the channel southward of İmralı adası, in Marmara denizi, *see* page 124; near Ostrov Bolshevik (page 176); between Nos Kaliakra and Capul Tuzla, page 187; in the vicinity of Odessa, page 219; in the approaches to Dneprovskiy liman (page 233), and of Bukhta Koktebel', *see* page 292; in Kerchenskiy proliv, page 299; and near Sinop, *see* page 431.

**RADIO STATIONS.**—The following coast radio stations, in the area covered by this volume, are open for public correspondence:—

10	<b>Bulgaria</b>	<b>Rumania</b>	<b>Turkey</b>
	Burgas	Constanța	Çanakkale
	Varna		(Cannakale in List)
			Istanbul

**U.S.S.R.**

15	Batumi	Sochi
	Feodosiya	Sukhumi
	Kerch' (Kertch in List)	Tuapse
	Kherson	Yalta
	Nikolayev	Zhdanov
20	Novorossiysk	
	Odessa	
	Poti	
	Rostov (Rostov na Donu in List)	

For details of these services, and also the weather bulletins, storm signals, navigational warnings, time signals, etc., transmitted by these stations, *see* Admiralty List of Radio Signals.

**FUEL.**—**Turkey.**—Coal and fuel oil can be obtained at İstanbul, and coal at Zonguldak.

**Rumania.**—Coal and fuel oil can be obtained at Constanța and Brăila, and fuel oil at Sulina.

**U.S.S.R.**—Coal and fuel oil can be obtained at Odessa, Nikolayev, Sevastopol', Tuapse, and Poti; coal and diesel oil at Novorossiysk; coal at Skadovsk, Kerch', Osipenko, Temryuk, Akhtari, Zhdanov, Taganrog, Port Azov, and Rostov; and fuel oil at Batumi.

**REPAIRS.**—Repairs, but in some cases of a minor character only, can be carried out at the following ports:—

**Turkey.**—İstanbul.

**Bulgaria.**—Varna.

**Rumania.**—Sulina and Galați.

**U.S.S.R.**—Odessa, Kherson, Nikolayev, Sevastopol', Feodosiya, Kerch', Osipenko, Akhtari, Zhdanov, Taganrog, Yeysk, Rostov, Novorossiysk, Tuapse and Batumi.

For details, *see* under the description of the individual ports.

The ports at which under-water repairs can be undertaken are given in Appendix I.

**AERO RADIOBEACONS.**—The positions of aero radiobeacons, transmissions from which might also be of use to the mariner, may be found on certain charts of the area covered by this volume. For details, see Admiralty List of Radio Signals.

**AERO LIGHTS.**—For remarks on aero lights, see N.P.100, *The Mariners' Handbook*. 5

**SUBMARINE CABLES.**—See N.P.100, *The Mariners' Handbook*.

**POLLUTION OF THE SEA BY OIL.**—See N.P.100, *The Mariners' Handbook*.

**AIR CUSHION CRAFT (HOVERCRAFT).**—See NP.100, *The Mariners' Handbook*. 10

**STANDARD TIME.**—All information regarding Standard times and Summer times will be found in Admiralty List of Radio signals.

**DE-RATTING.**—In accordance with Article 17 of the International Sanitary Regulations, de-rattng can be carried out and De-ratisation 15 Certificates and De-ratisation Exemption Certificates issued at:—

*Turkey*:—Istanbul; Zonguldak (certificates only).

*Bulgaria*:—Burgas; Varna.

*Romania*:—Constanța; Galati (certificates only).

*U.S.S.R.*:—*Full*.—Reni, Il'ichevsk; Odessa; Nikolayev; Feodosiya; 20 Kerch'; Zhdanov; Novorossiysk; Tuapse; Poti; Batumi.

*Certificates only*:—Kiliya; Sevastopol'; Yalta; Berdyansk; Sochi; Sukhumi.

**ICE.—Descriptive terms.**—In the area covered by this volume, ice is formed during the prolonged periods of frost which occur in winter in the 25 northern parts of the Black sea. The severity of the winter, and therefore the extent and thickness of the ice-cover, varies in different years but even in the most severe winter only a comparatively small part of the whole area of the Black sea is affected by ice. Navigation is obstructed in only three regions, River Danube, the north-western part of the Black sea, and 30 the sea of Azov, together with Kerchenskiy proliv. February is the month of greatest ice-cover in all these regions.

The descriptive terms of the W.M.O. Sea Ice nomenclature which was officially adopted by the World Meteorological Organisation in February, 1968, together with ice photographs, are given in N.P.100, *The Mariners' Handbook*. 35

*Chart 2835.*

**River Danube.**—During 51 years' observations of the ice in River Danube, from 1837 to 1887, the earliest date of closing was December 7th, and the latest February 23rd; the earliest date of the breaking up 40 of the ice was January 18th, and the latest March 30th. During this period the river remained open during 10 winters.

Loose ice coming down the river usually gives sufficient notice of the impending closing of the river to enable vessels to depart in time, but it sometimes happens that the freezing up is so sudden that a vessel 45 ascending the river after the first week in December runs a risk of being detained for two months or more. Before closing, the river usually "smokes" for a day or two; the frost then sets in hard, and the river freezes at once.

*Chart 2835.*

At Sulina, the river is frozen only in the most severe winters.

*Charts 2231, 2232.*

**North-western part of the Black sea.**—In average winters ice is found in a coastal belt, and in the bays and estuaries, from Mys Tarkhankut the western extremity of the Crimea, northward. It extends across the head of the Black sea and down the west side to a point between the delta of River Danube and Constanța. In extremely hard winters, pack-ice may be found in the open sea northward of the parallel of Mys Tarkhankut and a belt of coastal ice of varying width, up to 10 miles or more, extends along the southern part of the western shore of the Black sea. This may reach the northern entrance of the Bosphorus and sometimes even penetrates into that strait. It has been known to extend eastward of the strait along the coast of Anadolu (Anatolia) to the vicinity of Ereğli.

**Dnestrovskiy (Dniestr) liman** is frozen over annually, *see* page 215, and ice is formed every year in Dneprovskiy liman (Kherson bay). In the more open waters off Odessa, ice does not appear every year, though the harbours there hardly ever fail to freeze over. In the offing, such ice as is seen is usually pack-ice from Dneprovskiy liman, and does not last long, but during very severe winters, fast-ice has been known to reach as far as Ochakov. The average maximum thickness of the ice off Odessa is 13 inches (0m33).

The eastern part of Karkinitskiy (Karkinit) zaliv also freezes over every year, but in the open sea off Ostrov Dzharylgach ice does not appear every year. The ice in Dzharylgachskiy zaliv usually appears in the middle of December, and disappears during the latter half of March. The average maximum thickness of the ice is  $9\frac{1}{2}$  inches (0m24) in the southern part of this bay, and nearly 11 inches (0m27) in its northern part.

*Charts 2232, 2235.*

The average maximum thickness of the ice is  $9\frac{1}{2}$  inches (0m24) in the southern part of Dzharylgachskiy zaliv, and nearly 11 inches (0m27) in its northern part.

Off the Crimean coast, between Mys Tarkhankut and Mys Chauda, ice appears only in the relatively shallow and enclosed bays, namely Yevpatoriya, Sevastopol', Feodosiya, Anapa, and Novorossiysk, and then only for short periods in the hardest winters. In these regions also, ice usually appears off Yevpatoriya, Kyz-Aul, and Anapa, but only in the form of slush, narrow bands of fast-ice, and small, broken ice. This ice lasts only for two or three days or a week; it disappears and reappears several times during the course of a winter.

Fuller details concerning the dates of appearance, freezing over, breaking-up, and disappearance of ice in the Black sea are given in the tables on pages 32–36.

For further details concerning ice conditions, *see* under the headings of the various ports.

*Chart 2216.*

**Kerchenkiy proliv.**—On an average, ice begins to appear in Kerchenkiy proliv about the beginning of January, both as regards the local formation of ice and pack-ice from the northern parts of the Sea of Azov. Its first appearance, however, sometimes occurs during the last 10 days of December. Off the town of Kerch' the interval between the first appearance of ice and "freezing over" is not more than one or 2 days.

The ice is unstable; in the course of the winter, the ice in Kerchen-skaya bukhta (Kerch roads) will break up and entirely disappear several times. The mean thickness of the ice is about 8 inches (0m20), but,

*Chart 2216.*

occasionally, it is twice as much. Traffic is established over the ice within the limits of the bay every year, and, in hard winters, between Kerch' and Tamanskiy poluoostrov.

Northerly and north-easterly winds often cause an accumulation of ice in the northern entrance of the strait, forming large, solid, hummocky fields of packed ice. Large hummocks of ice sometimes form in the strait itself, and, together with the variable currents, make navigation difficult even for ice-breakers. 5

The break up of ice begins earlier in the strait than in the Sea of Azov; off Kerch', it occurs, on an average, in the middle of February or early in March. The ice drifts with the wind and current and, at times, disappears and reappears. The ice in the strait is frequently driven out into the Black sea by the current and by fresh northerly or north-easterly winds. 10 15

*Chart 2234.*

**Sea of Azov.**—During winter, navigation in the Sea of Azov is much hindered by ice, and, in many cases, can only be maintained with the aid of powerful ice-breakers. Navigation is then most difficult off the northern shore and in the entrance to Taganrogskiy zaliv, and also, with prolonged northerly or north-easterly winds, in the approach to Kerchen- 20 skiy proliv.

Ice first appears in the autumn in the land-locked bays, in shallow and fresh water estuaries, and in the mouths of the more sluggish rivers. In the more open places, the ice, even during the winter, is frequently broken up by fresh winds, and drifts hither and thither with the current. 25 In the spring, the ice does not remain in the shallow areas and narrow channels much later than in the areas more exposed to the action of the wind and waves.

Observations of the ice conditions in the central part of the Sea of Azov have only been obtained near the usual routes of the icebreakers between Kerch' and Berdyanskiy zaliv or Zhadnov. Broken ice, driven from Taganrogskiy zaliv (Gulf of Taganrog) by prolonged north-easterly or northerly winds, soon appears in the central part of the sea. Owing to the variable nature of the wind, parts of the hummocky ice formed along the edges of the shore-fast ice are broken away, so that towards the end of January, or early in February, the whole sea becomes filled with pack-ice in fields of varying size, shape, and thickness. The whole central area appears to freeze over only in the most severe winters. 30 35

Reports from ice-breakers indicate the extraordinary diversity in the nature of the ice; in one position it may be thick and heavily packed, while a mile away it may be thin, and another mile farther away there may be field ice or open water. 40

The average thickness of the field ice is from 4 to 8 inches (0m1 to 0m2); the hummocks are from about 3½ to 7 feet (1m1 to 2m1) high. 45

The following remarks on the general course of the freezing over and the break up of ice in the Sea of Azov are based on observations obtained over a period of many years.

**Western shore.**—Observations of ice conditions off the western shore have been scanty and irregular, but they indicate that the ice first appears here in the middle of December; it is partly pack-ice from Utlyukskiy liman (Utlyuk estuary), and partly of local formation. 50

In the vicinity of Genichesk, ice first appears in the middle of December, but there have been cases where it has not appeared before the last week in February. The ice is of local formation, and quickly covers Utlyukskiy liman. This vicinity is frozen over about 18 days after the first appearance 55



*Chart 2234.*

of ice; the maximum being 30 days, and the minimum 7 days; but it does not freeze over completely every year. During the winter the ice frequently breaks up, and pack-ice may be driven out to sea by the  
 5 wind, leaving the offing entirely free from ice for several days. Communication, over the ice, with Biryuchiy ostrov has been practicable during 13 out of 22 years. The average thickness of the ice is 16 inches (0m4), but is sometimes as much as 28 inches (0m7). The number of  
 10 days with ice varies between 35 and 134; and the vicinity is completely frozen over for about 40 days, the period varying between 0 and 82 days. The ice breaks up about the end of February, and the offing becomes completely clear of ice towards the end of March. In hard winters, ice may remain in Utlyukskiy liman until early in May.

*Northern shore.*—Off the northern shore, ice appears later than at  
 15 Genichesk or than in Taganrogskiy zaliv. It generally consists of pack-ice, and its appearance is connected with the direction of the winds prevailing during December. The prevalence of southerly or westerly winds delays the formation of ice. Off Nizhniy-Berdyanskiy lighthouse, ice usually appears about December 25th, though it may frequently  
 20 appear some days earlier, and, in exceptional seasons, may not appear until the beginning of February. The sea usually freezes over from 10 to 20 days after the first appearance of ice, but, in some winters, only parts of it freeze over, and, in such cases, the intervening areas become covered with pack-ice.

25 Under the influence of the wind, the broken ice forms hummocks along the edge of the fast-ice parallel to the coastline, through which even ice-breakers occasionally find difficulty in forcing a passage. This belt of hummocks may be about 2 miles wide and 3 feet (0m9) high, though some hummocks may attain an elevation of from 30 to 40 feet  
 30 (9m1 to 12m2), or even, exceptionally up to 65 feet (19m8).

The average number of days with ice is 85, the maximum being 105, and the minimum 25. The fast-ice usually lasts about 29 days, the maximum being 84 days, and the minimum, nil.

The ice breaks up towards the end of February, and finally disappears  
 35 from 20 to 25 days later. It frequently breaks up during the course of the winter and sometimes completely disappears for several days.

The thickness of the level ice varies, but is always greater towards Taganrogskiy zaliv, and less off the more open parts of the shore; off  
 40 Nizhniy-Berdyanskiy lighthouse, the average thickness is 11 inches (0m28). In some winters, communication over the ice is possible between Osipenko and Zhdanov, and is possible almost every year between Osipenko and Berdyanskaya kosa.

*Eastern shore.*—Observations off the eastern shore of the Sea of Azov are very incomplete, but they indicate that ice first appears here at the  
 45 same time, or a little later than, in Taganrogskiy zaliv, that is, during the first half of December. Off this shore the sea takes somewhat longer to freeze over, and the ice is less stable in character, due, no doubt, to its more open nature. The ice usually appears earlier in the estuaries than in the offing. The period between the first appearance and the final  
 50 clearance of ice is about 3 months. The ice break-up takes place early in March, and clears completely from 7 to 8 days later.

*Taganrogskiy zaliv.*—Ice usually forms in Taganrogskiy zaliv early in December. The channels of the delta of Reka Don begin to fill with ice forming along their banks, whilst the gulf becomes filled with grease-  
 55 ice, and broken ice partly composed of river ice and partly of pieces of shore fast-ice broken up by the wind.

*Chart 2234.*

At Taganrog, the formation of ice proceeds very quickly, and the sea is usually frozen over within 5 days after the first appearance of ice, but, in other parts of the gulf, the ice forms much more slowly, taking from 19 to 22 days. Part of the shore fast-ice occasionally breaks up in December and pieces are frequently broken away by the wind and carried out to sea; but a few days later the sea will once more be covered with ice. Off Belosarayskiy lighthouse the sea becomes clear of ice in places during the winter. 5

The gulf is covered with ice from the end of December until the end of February, or, occasionally, until the beginning of March. During this period, communication over the ice is possible between Belosarayskiy lighthouse and Zhdanov, Taganrog, Azov, and Rostov; and, after the end of January, between Belosarayskiy lighthouse and Yeysk, and between Yesyk and Zhdanov. 10 15

At Taganrog, the average thickness of the ice is 20 inches (0m5), and off Belosarayskiy lighthouse, 18 inches (0m45). In hard winters these figures increase to 42 inches (1m1) and 30 inches (0m75), respectively; in mild winters, they may fall to 8 inches (0m2), or even less. Cases have been reported when, after strong and prolonged easterly winds, the ice in the approaches to Zhdanov has attained a thickness of 20 feet (6m1), and has become impassible even for a powerful ice-breaker. 20

The ice breaks up later in Taganrogskiy zaliv than in any other part of the Sea of Azov. Between the break-up and the final clearance of ice there is usually a period of 23 days off Belosarayskiy lighthouse, 12 days at Taganrog, and 5 days at Azov. 25

The gulf usually becomes completely clear of ice about the end of March, but, in severe winters, it may not be clear until the middle of April.

For further details of ice conditions at the various ports, see tables on pages 32-36. 30

For remarks on ice accumulation on the hulls and superstructures of ships, see page 64.

## DATES OF APPEARANCE OF ICE

Place	No. of years of observations	Mean day	Extreme dates		No. of years with no ice
			Early	Late	
Dnestrovsko-Tsaregradskiy lt. ho.	26	Dec. 8	Nov. 6, 1907	Jan. 9, 1911	—
Mya Bol'shoy Fontan	10	Jan. 23	Jan. 11, 1926	Feb. 10, 1923	2
Odesskiy port	33	Jan. 4	Dec. 1, 1931	Feb. 10, 1923	5
Odesskiy port offing	26	Jan. 15	Dec. 20, 1899	Feb. 22, 1889	5
Ochakov	31	Dec. 14	Nov. 16, 1908	Feb. 21, 1902	—
Tendrovskaya kosa offing	8	Jan. 8	Dec. 8, 1927	Feb. 7, 1932	—
Tendrovskiy zaliv	9	Jan. 8	Dec. 8, 1927	Feb. 9, 1923	—
Nikolayev	35	Dec. 14	Nov. 11, 1908	Jan. 20, 1902	—
Adzhigiol'skiy lt. ho.	8	Dec. 9	Nov. 21, 1931	Dec. 20, 1930	—
Svyatotoitskiy light	24	Dec. 12	Nov. 17, 1927	Jan. 8, 1913	—
Stanislav	7	Dec. 11	Nov. 26, 1931	Dec. 24, 1928	—
Kasperovka	7	Dec. 10	Nov. 27, 1931	Dec. 23, 1928	—
Kherson	12	Dec. 15	Nov. 29, 1927	Jan. 8, 1923	—
Skadovak	9	Dec. 12	Nov. 21, 1927	Dec. 26, 1923	—
Khorly	9	Dec. 12	Nov. 22, 1927	Jan. 3, 1924	—
Dzharylgachskiy zaliv	17	Dec. 28	Nov. 20, 1931	Feb. 16, 1918	—
Ostrov Dzharylgach offing	14	Jan. 3	Dec. 1, 1931	Jan. 21, 1914	—
Tarkhankut	8	Feb. 2	Feb. 1, 1929	Feb. 7, 1938	5
Yevpatoriya	6	Jan. 10	Dec. 7, 1927	Feb. 7, 1932	—
Feodosiya	6	Feb. 3	—	—	1
Kyz-Aul	8	Feb. 9	Jan. 26, 1927	Feb. 24, 1930	4
Anapa	6	Dec. 19	Nov. 23, 1927	Dec. 30, 1930	—

## DATES OF FREEZING OVER

Place	No. of years of observations	Mean day	Extreme dates		No. of years did not freeze over
			Early	Late	
Dnestrovsko-Tsaregradskiy lt. ho.	9	Dec. 26	Nov. 17, 1902	Jan. 31, 1911	—
Mya Bol'shoy Fontan	10	Feb. 25	Feb. 16, 1929	Mar. 6, 1932	8
Odesskiy port	20	Jan. 24	Dec. 16, 1902	Feb. 19, 1913	7
Odesskiy port offing	16	Feb. 7	Jan. 19, 1924	Feb. 23, 1927	10
Ochakov	17	Dec. 30	Nov. 16, 1908	Feb. 18, 1923	—
Tendrovskaya kosa offing	8	Feb. 10	—	—	7
Tendrovskiy zaliv	9	Jan. 26	Jan. 3, 1928	Feb. 16, 1923	2
Nikolayev	15	Dec. 18	Nov. 27, 1914	Jan. 20, 1902	—
Adzhigiol'skiy lt. ho.	9	Dec. 28	Nov. 29, 1931	Jan. 24, 1926	—
Svyatotoitskiy light	16	Jan. 1	Nov. 30, 1914	Jan. 25, 1917	—
Stanislav	7	Dec. 29	Dec. 4, 1927	Feb. 8, 1932	—
Kasperovka	7	Dec. 27	Dec. 5, 1927	Feb. 8, 1932	—
Kherson	11	Dec. 26	Dec. 2, 1931	Jan. 23, 1923	—
Skadovak	9	Dec. 30	Dec. 2, 1931	Jan. 24, 1926	—
Khorly	9	Jan. 23	Dec. 16, 1924	Feb. 24, 1927	2
Dzharylgachskiy zaliv	13	Jan. 12	Dec. 7, 1931	Feb. 2, 1913	—
Ostrov Dzharylgach offing	12	Feb. 1	Jan. 19, 1927	Feb. 16, 1932	7

## DATES OF BREAK UP OF ICE

Place	No. of years of observations	Mean day	Extreme dates		No. of years did not freeze over
			Early	Late	
Dnestrovsko-Tsaregradskiy lt. ho.	12	Feb. 16	Jan. 14, 1914	Mar. 11, 1911	—
Mys Bol'shoy Fontan . . . . .	10	Mar. 5	Mar. 1, 1929	Mar. 9, 1932	8
Odesskiy port . . . . .	24	Feb. 19	Jan. 22, 1901	Mar. 9, 1932	9
Odesskiy port offing . . . . .	19	Feb. 11	Jan. 2, 1889	Mar. 1, 1929	12
Ochakov . . . . .	18	Feb. 28	Feb. 1, 1913	Mar. 27, 1929	—
Tendrovskaya kosa offing . . . . .	8	Feb. 12	—	—	7
Tendrovskiy zaliv . . . . .	9	Mar. 3	Feb. 18, 1923	Mar. 22, 1929	2
Nikolayev . . . . .	22	Mar. 3	Jan. 26, 1923	Apr. 3, 1932	—
Adzhigiol'skiy . . . . .	9	Mar. 9	Feb. 1, 1925	Mar. 31, 1929	—
Svyatotoitskiy light . . . . .	17	Feb. 19	Jan. 10, 1892	Mar. 31, 1929	—
Stanislav . . . . .	7	Mar. 9	Feb. 20, 1931	Mar. 22, 1929	—
Kasperovka . . . . .	7	Mar. 1	Feb. 1, 1931	Mar. 25, 1929	—
Kherson . . . . .	11	Mar. 9	Feb. 12, 1925	Mar. 25, 1929	—
Skadovak . . . . .	9	Mar. 7	Jan. 23, 1925	Mar. 31, 1929	—
Khorly . . . . .	9	Feb. 19	Jan. 23, 1930	Mar. 22, 1929	2
Dzharylgachskiy zaliv . . . . .	12	Feb. 27	Jan. 12, 1910	Mar. 30, 1929	—
Ostrov Dzharylgach offing . . . . .	11	Feb. 18	Jan. 26, 1927	Mar. 7, 1932	6

## DATES OF DISAPPEARANCE OF ICE

Place	No. of years of observations	Mean day	Extreme dates		No. of years with no ice
			Early	Late	
Dnestrovsko-Tsaregradskiy lt. ho.	25	Mar. 7	Jan. 23, 1908	Mar. 30, 1907	—
Mys Bol'shoy Fontan . . . . .	10	Mar. 12	Feb. 21, 1931	Mar. 28, 1928	2
Odesskiy port . . . . .	32	Mar. 1	Jan. 9, 1908	Apr. 1, 1928	5
Odesskiy port offing . . . . .	25	Feb. 24	Jan. 22, 1897	Mar. 28, 1928	5
Ochakov . . . . .	30	Mar. 13	Feb. 10, 1892	Apr. 19, 1929	—
Tendrovskaya kosa offing . . . . .	8	Mar. 2	Dec. 29, 1929	Mar. 31, 1932	—
Tendrovskiy zaliv . . . . .	8	Mar. 12	Jan. 27, 1925	Apr. 7, 1932	—
Nikolayev . . . . .	32	Mar. 14	Jan. 7, 1895	Apr. 17, 1929	—
Adzhigiol'skiy lt. ho. . . . .	9	Mar. 22	Feb. 19, 1925	Apr. 8, 1932	—
Svyatotoitskiy light . . . . .	22	Mar. 18	Feb. 12, 1916	Apr. 19, 1929	—
Stanislav . . . . .	7	Mar. 26	Mar. 12, 1930	Apr. 10, 1929	—
Kasperovka . . . . .	7	Mar. 25	Mar. 12, 1930	Apr. 6, 1929	—
Kherson . . . . .	11	Mar. 20	Feb. 13, 1925	Apr. 6, 1929	—
Skadovak . . . . .	9	Mar. 18	Feb. 11, 1925	Apr. 4, 1929	—
Khorly . . . . .	9	Mar. 15	Feb. 11, 1925	Apr. 3, 1929	—
Dzharylgachskiy zaliv . . . . .	14	Mar. 9	Jan. 12, 1910	Apr. 2, 1929	—
Ostrov Dzharylgach offing . . . . .	12	Mar. 7	Jan. 12, 1910	Mar. 27, 1932	—
Tarkhankut . . . . .	8	Feb. 25	Feb. 15, 1910	Mar. 3, 1928	5
Yevpatoriya . . . . .	6	Feb. 28	Jan. 23, 1930	Mar. 27, 1928	—
Feodosiya . . . . .	6	Feb. 22	—	—	4
Kyz-Aul . . . . .	8	Feb. 27	Feb. 1, 1927	Mar. 20, 1928	1
Anapa . . . . .	5	Mar. 8	Jan. 27, 1931	Mar. 23, 1929	—

## NUMBER OF DAYS WITH ICE IN THE YEAR

Place	No. of years of observations	Mean of days per month						Days per year		
		Nov.	Dec.	Jan.	Feb.	Mar.	April	Mean	Max.	Min.
Mys Bol'shoy Fontan	10	—	0-4	5-0	15-0	10-0	—	30-4	64	0
Odesa	17	—	3-2	8-2	17-8	7-7	—	36-9	95	0
Ochakov	16	1-5	14-0	24-0	23-7	13-0	1-3	77-5	128	12
Kesperovka	7	0-7	19-3	29-0	27-3	21-4	1-0	98-7	130	73
Kherson	11	0-4	14-5	27-3	25-7	16-8	0-5	85-2	121	61
Svyatotsroitskiy light	16	1-1	14-2	26-8	24-0	16-5	1-5	84-1	130	51
Nikolayev	10	1-5	15-0	29-2	27-2	17-6	1-2	91-7	131	15
Tendrovskiy zaliv	7	0-1	7-1	15-6	19-7	12-0	1-0	55-5	107	24
" offing	8	—	3-8	7-3	16-2	10-5	—	37-8	82	7
Daharylgachskiy zaliv	15	0-1	8-8	19-4	22-0	11-0	—	61-3	120	4
" offing	13	—	4-0	14-8	20-8	9-0	—	48-6	106	1
Skadovsk.	9	1-0	16-7	28-1	25-8	18-3	0-4	90-3	129	59
Khorly	9	1-0	14-8	27-0	23-7	14-5	0-2	81-2	124	51
Tarkhankut	8	—	—	—	8-0	0-4	—	8-4	27	0
Yevpatoriya	6	—	1-3	2-5	12-4	3-8	—	20-0	36	2
Feodosiya	6	—	—	—	4-3	0-3	—	4-6	17	0
Kyz-Aul	7	—	—	0-6	4-0	2-2	—	6-8	18	0

## DATES OF APPEARANCE OF ICE

Place	No. of years of observations	Mean day	Extreme dates	
			Early	Late
Kerch'	29	Jan. 6	Dec. 13, 1921	Feb. 21, 1902
Yenikal'skiy lt. ho.	8	Dec. 23	Nov. 23, 1927	Jan. 23, 1926
Kazantipskiy zaliv	6	Jan. 3	Nov. 29, 1929	Jan. 20, 1930
Genichesk	44	Dec. 17	Nov. 10, 1897	Feb. 21, 1902
Nizhniy-Berdyanskiy lt. ho.	35	Dec. 25	Nov. 15, 1908	Feb. 10, 1899
Temryukskiy zaliv	6	Nov. 30	Nov. 8, 1914	Dec. 9, 1916
Glukhoy kanal	10	Nov. 29	Nov. 9, 1914	Dec. 10, 1916
Akhtari	6	Dec. 5	Nov. 2, 1921	Dec. 27, 1923
Belosarayskiy lt. ho.	38	Dec. 22	Nov. 8, 1908	Jan. 28, 1902
Zhdanov	19	Dec. 9	Nov. 25, 1868	Jan. 3, 1875
Taganrog	48	Dec. 1	Nov. 1, 1916	Jan. 16, 1892
Yeysk	26	Dec. 9	Oct. 29, 1920	Dec. 30, 1878
Azov	11	Nov. 27	Nov. 2, 1920	Dec. 16, 1923
Rostov	23	Dec. 8	Nov. 16, 1873	Jan. 3, 1875

## DATES OF FREEZING OVER

Place	No. of years of observations	Mean day	Extreme dates	
			Early	Late
Kerch' . . . . .	25	Jan. 7	Dec. 13, 1921	Feb. 17, 1923
Yenikal'skiy lt. ho. . . . .	8	Jan. 10	Dec. 3, 1931	Feb. 28, 1930
Kazantipskiy zaliv . . . . .	6	Jan. 18	Dec. 21, 1931	Feb. 3, 1931
Genicheak . . . . .	31	Jan. 4	Nov. 13, 1897	Feb. 21, 1918
Nizhniy-Berdyanskiy lt. ho. . . . .	24	Jan. 13	Dec. 4, 1896	Mar. 14, 1902
Temryukskiy zaliv . . . . .	8	Jan. 13	Dec. 1, 1920	Feb. 12, 1923
Glukhoy kanal . . . . .	6	Dec.30	Dec. 2, 1915	Jan. 23, 1917
Akhtari . . . . .	6	Jan. 7	Dec. 9, 1924	Feb. 15, 1923
Belosarayskiy lt. ho. . . . .	24	Jan. 2	Nov. 29, 1897	Feb. 21, 1902
Zhdanov . . . . .	5	Jan. 1	Dec. 13, 1924	Jan. 12, 1923
Taganrog . . . . .	34	Dec. 6	Nov. 10, 1914	Jan. 16, 1892
Yeysk . . . . .	7	Dec.30	Nov. 27, 1920	Feb. 10, 1919
Azov . . . . .	14	Dec. 7	Nov. 3, 1920	Jan. 14, 1914
Rostov . . . . .	6	Dec.17	Nov. 28, 1931	Jan. 24, 1927

## DATES OF BREAK UP OF ICE

Place	No. of years of observations	Mean day	Extreme dates	
			Early	Late
Kerch' . . . . .	26	Feb.15	Dec. 20, 1888 } Dec. 20, 1889 }	Mar. 29, 1898
Yenikal'skiy . . . . .	8	Mar. 1	Feb. 1, 1925	Mar. 4, 1929
Kazantipskiy zaliv . . . . .	5	Mar.15	Feb. 23, 1930	Apr. 1, 1929
Genicheak . . . . .	34	Feb.27	Jan. 22, 1914	Apr. 2, 1898
Nizhniy-Berdyanskiy lt. ho. . . . .	28	Mar. 4	Jan. 23, 1916	Mar. 25, 1891 1917
Temryukskiy zaliv . . . . .	9	Feb.28	Feb. 2, 1925	Mar. 23, 1921
Glukhoy kanal . . . . .	10	Feb.22	Jan. 10, 1918	Mar. 21, 1921
Akhtari . . . . .	7	Mar. 4	Feb. 20, 1925	Mar. 20, 1921
Belosarayskiy lt. ho. . . . .	25	Feb.27	Jan. 10, 1899	Mar. 31, 1896
Zhdanov . . . . .	7	Mar.10	Feb. 23, 1925	Mar. 29, 1924
Taganrog . . . . .	33	Mar.15	Jan. 15, 1903	Apr. 8, 1898
Yeysk . . . . .	9	Mar. 7	Feb. 18, 1923	Mar. 28, 1928
Azov . . . . .	11	Mar.12	Feb. 21, 1914	Mar. 26, 1921
Rostov . . . . .	6	Mar.22	Feb. 15, 1918	Apr. 6, 1898

## DATES OF DISAPPEARANCE OF ICE

Place	No. of years of observations	Mean day	Extreme dates	
			Early	Late
Kerch'	28	Feb. 27	Jan. 11, 1910	Mar. 31, 1909
Yenikal'skiy lt. ho.	8	Mar. 30	Feb. 21, 1925	Apr. 30, 1929
Kazantipskiy zaliv	5	—	Mar. 13, 1930	Apr. 4, 1929
Genichesk	52	Mar. 24	Feb. 20, 1925	May 2, 1898
Nizhniy-Berdyanskiy lt. ho.	39	Mar. 24	Feb. 18, 1904	Apr. 19, 1889
Temryukskiy zaliv	11	Feb. 28	Jan. 24, 1916	Mar. 27, 1917
Glukhoy kanal	12	Mar. 3	Feb. 9, 1916	Mar. 23, 1921
Akhtari	7	Mar. 12	Feb. 23, 1925	Apr. 2, 1917
Belosarayskiy lt. ho.	39	Mar. 22	Jan. 26, 1895	Apr. 15, 1889
Zhdanov	27	Mar. 24	Mar. 6, 1870	Apr. 10, 1875
Taganrog	58	Mar. 27	Mar. 4, 1914	Apr. 17, 1896
Yeysk	27	Mar. 27	Feb. 27, 1925	Apr. 13, 1875
Azov	11	Mar. 19	Feb. 24, 1914	Apr. 7, 1918
Rostov	24	Mar. 25	Feb. 24, 1879	Apr. 7, 1875

## NUMBER OF DAYS WITH ICE

Place	No. of years' observations	Mean of days per month						Days per year		
		Nov.	Dec.	Jan.	Feb.	Mar.	April	Mean	Max.	Min.
Kerch'	28	—	3	16	12	5	—	36	83	0
Genichesk	30-32	2	12	24	23	17	2	80	134	35
Nizhniy-Berdyanskiy lt. ho.	28-30	1	11	24	26	21	2	85	150	25
Belosarayskiy lt. ho.	28	1	16	26	25	21	1	90	140	32
Taganrog	28-29	6	23	30	28	24	2	113	153	82

MAXIMUM AND MINIMUM NUMBER OF WITH ICE  
PER MONTH

Place	Nov.		Dec.		Jan.		Feb.		March		April		May	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
Kerch'	0	0	13	0	31	0	29	0	26	0	9	0	—	—
Genichesk	16	0	31	0	31	0	29	0	31	0	30	0	5	0
Nizhniy-Berdyanskiy lt. ho.	16	0	31	0	31	0	29	0	31	0	22	0	4	0
Belosarayskiy lt. ho.	14	0	31	0	31	4	29	0	31	0	21	0	4	0
Taganrog	23	0	31	0	31	9	29	31	31	3	22	0	—	—

**Chart 2214.**

**RANGE OF WATER LEVEL.**—The depths shown on the charts of Marmara denizi, the Black sea, and the Sea of Azov are usually the depths at mean water level. Tidal influence has little effect upon the water level; the average spring range in the western part of the Black sea is only 3·2 inches (0m08). The level is, however, subject to considerable changes due to variations in the volume of water discharged by the rivers, and variations of wind and atmospheric pressure. 5

The level of the water in the Dardanelles rises, at times, as much as 2 feet (0m6) above the normal, and strong southerly winds will raise the level in the Bosphorus by a similar amount. 10

At Kilyos, near the entrance to the Bosphorus from the Black sea, the water level has been reported to vary from 3 to 5 feet (0m9 to 1m5).

At Constanța, strong north-westerly winds may reduce the water level by as much as 2 feet (0m6). 15

The following information is taken from the U.S.S.R. pilots for the Black sea and Sea of Azov:—

The range in the mean annual level of the water in the Black sea and Sea of Azov is from 2 to 2½ inches (0m05 to 0m06), but exceptionally, a rise of 6 inches (0m15) and a fall of 7 inches (0m18), has been recorded. 20

Similar changes of level have been noticed throughout the Black sea, and it therefore appears that this sea contains a greater volume of water in some years than in others.

**Black sea.**—The water level in the Black sea undergoes regular fluctuations throughout the year, the range being from 20 to 60 inches (0m50 to 1m52). The maximum and minimum levels at various ports, as observed over periods of between 3 and 20 years, in this sea are given in the table below. 25

Place	Water level			
	Maximum rise		Maximum fall	
	Ft. in.	Cm.	Ft. in.	Cm.
Odessa . . . . .	2 7	78	4 0	114
Kherson . . . . .	10 3	312	3 9	111
Nikolayev . . . . .	3 0	92	2 11	90
Skadovsk . . . . .	2 3	68	2 10	87
Khorly . . . . .	3 1	95	3 0	91
Ak-Mechet . . . . .	1 5	42	1 3	38
Yevpatoriya . . . . .	1 4	40	1 8	51
Sevastopol' . . . . .	1 1	34	1 3	38
Yalta . . . . .	1 2	35	0 10	26
Alushta . . . . .	2 1	63	0 11	29
Sudak . . . . .	1 4	41	1 11	27
Feodosiya . . . . .	1 5	42	2 0	62
Kerch' . . . . .	1 9	53	1 6	45
Anapa . . . . .	1 3	38	1 1	33
Novorossiysk . . . . .	1 4	40	1 1	34
Tuaspe . . . . .	1 5	44	1 2	35
Gagry . . . . .	1 3	39	1 0	31
Sukhumi . . . . .	1 5	42	1 1	32
Poti . . . . .	1 10	56	1 7	47

These ports can be divided into two groups: those ports directly affected by the outflow of rivers, and those ports which are not so affected. Odessa and Kerch' are included in the former group. The highest level in the former group occurs in May, and, in the latter group, from June to July. The level falls quickly during the summer, reaches its lowest level 30



**Chart 2214.**

in October or November, and then increases, slowly at first, and then, from April to May, more rapidly.

- Winds exercise a considerable effect upon the water level. In general, onshore winds tend to raise, and offshore winds to lower the level. The range of level thus caused depends largely upon local conditions, being much more marked in bays and inlets than in more open places. The following table given the directions of the winds causing the greatest effect on the water level at various places, and the range of level caused by such winds.

Besides the above variations, the water level is subject to seiches, usually caused by atmospheric disturbances, which may have a range of 20 inches (0m5) or more.

Place	Winds causing greatest changes in water level		Mean range of water level	
	Increase	Decrease	Inches	Centi-metres
Dnestrovakiy liman . . . . .	NE.	SW.	9·1	23
Odesa . . . . .	SE.	NW.	11·0	28
Ochakov . . . . .	S.	N.	7·9	20
Tarkhankut . . . . .	S.	NE.	4·3	11
Sevastopol' . . . . .	W.	E.	2·4	6
Yalta . . . . .	SW.	N.	2·0	5
Kerch' . . . . .	S.	W.	2·4	6
Poti . . . . .	W.	E.	5·5	14

**Chart 2234.**

- Sea of Azov.**—The water level in the Sea of Azov is subject to considerable variations, besides the variations from year to year, which are similar to those, given above, for the Black sea. These yearly variations are due to changes in the amount of rainfall in the different years.

- The water level in this sea is highest in June and lowest in autumn, and is usually higher than the mean level for the year from April to August, and lower from September to March. The mean yearly range, from observations over many years, is from 10 to 20 inches (0m25 to 0m50).

- In different years the dates of highest and lowest levels may differ considerably from the mean dates. The maximum may occur from May to July, and the minimum from October to December, but the date of maximum level is notably more constant than that of the minimum.

The following table gives the maximum and minimum levels at various ports in the Sea of Azov. It will be noticed that the range is larger in the gulfs and narrow inlets, and is smaller in the more open parts of the sea.

Place	Water level			
	Maximum rise		Maximum fall	
	Ft. in.	Metres	Ft. in.	Metres
Genichesk . . . . .	5 9	1·76	4 6	1·38
Osipenko . . . . .	2 9	0·84	1 8	0·51
Temryuk . . . . .	5 9	1·76	2 1	0·64
Akhtari . . . . .	7 6	2·29	4 11	1·51
Zhdanov . . . . .	3 3	0·99	3 4	1·03
Taganrog . . . . .	6 11	2·12	7 6	2·30
Yeyak . . . . .	4 0	1·21	5 4	1·26

*Chart 2234.*

Considerable changes in level are also recorded, being mainly due to the action of the wind. Cases have occurred when an area near Taganrog has dried as much as 3 miles offshore, and, on the other hand, the harbour quay here, which is 7 feet (2m1) above mean level, has been known to 5 have been flooded.

The strength of the wind, as well as its direction, has a large effect on the change in level, the range of which is greatest in autumn and winter, when the winds attain their greatest force. An exception to this is Taganrog, where the maximum range occurs in April, since the spring freshets 10 of Reka Don have a large influence on the level there.

The following table gives the direction of the winds causing the greatest effects on the water level at Genichesk and at Taganrog.

Place	Winds causing greatest changes in water level		Mean range of water level	
	Increase	Decrease	Ft. in.	Metres
Genichesk . . . .	ENE.	W.	1 0	0.30
Taganrog . . . .	W.	E.	2 0	0.60

Seiches, with a period of about  $24\frac{1}{2}$  hours, and similar, but secondary, fluctuations, with a period of from 6 to 7 hours, also occur. Their range 15 amounts to about 10 inches (0m25) at Temryuk, from 12 to 24 inches (0m3 to 0m6) at Yeysk, and 37 inches (0m95) at Taganrog. These seiches appear to be mainly due to the effect of the wind, and may attain very large dimensions; they last, occasionally, for more than 10 days.

The effects of the tide in the Sea of Azov are completely masked by 20 the variations due to the action of the wind and the seiches.

*Chart 2214.*

**CURRENTS.—General remarks.**—The broad features of the current system in the areas described in this work are a counter-clockwise circulation of the waters of the Black sea, and an almost constant flow of water 25 from the Black sea, through the Bosphorus, Marmara denizi, and the Dardanelles, to the Mediterranean.

The primary cause of the flow from the Black sea is that the surface of this sea is, almost invariably, at a higher level than that of Marmara denizi. The average excess has been computed to be about 17 inches 30 (0m4). The flow of water from the Black sea to Marmara denizi causes the level of the latter sea to be above that of the Mediterranean. The water level in the Black sea undergoes changes in the course of each year, and the mean level is not the same in different years. *See* Range of water level, page 37. 35

Under the influence of southerly winds, especially if these are strong and of prolonged duration, the water level in the Bosphorus and the Dardanelles rises, sometimes as much as 2 feet (0m6). The current is thus reduced in rate or even reversed in direction.

The water level in the Black sea is maintained by the enormous volume 40 of water discharged into it by the rivers, and by the relatively large rainfall over the eastern part of the sea; *see* page 59. The north-western part of the sea receives the greatest volume of river water, from River Danube, Reka Dnesta, Reka Dnepr and Reka Yuzhnyy Bug. The volume of water discharged by River Danube alone is about 300 thousand million 45

*Chart 2214.*

tons in an average year. If there were no evaporation and outlet from the Black sea, the average volume of water discharged by River Danube would raise the water level in that sea by about one foot (0m3) in a year.

- 5 In addition, the outflow from the rivers which drain into the Sea of Azov cause a considerable volume of water to flow into the Black sea through Kerchenskiy proliv.

Other factors aiding the flow of water from the Black sea to the Mediterranean are the prevalence of northerly and north-easterly winds over the region for about 9 months of the year, and the difference of specific gravity between the relatively fresh surface layer of the Black sea and the saline water of the Mediterranean.

- Below the south-going surface current which flows from the Black sea to the Mediterranean there is a slower under-current of salter water  
15 in the reverse direction, partially compensating the surface flow. It has been computed that this surface flow removes  $2\frac{1}{2}$  times the volume of water from the Black sea as is returned to that sea by the under-current. The excess of the surface flow over the subsurface flow is the net loss of water from the Black sea by outflow. Much water is also lost from this  
20 sea by evaporation. The volume of water gained by the Black sea by river discharge and rainfall is balanced, in the long run, by the volume of water lost due to the two causes mentioned above.

*Chart 224.*

- Since the same volume of water, flowing out of the Black sea, passes  
25 through the narrow channels of the Bosphorus and the Dardanelles as through Marmara denizi, it follows that the surface current must be much stronger in the straits than across the latter sea. This also applies to the north-going under-current.

- The surface current in the Bosphorus and the Dardanelles is similar in  
30 character to that which would be produced by a great jet of water under high pressure, directed down the narrow and irregular channels. This is particularly marked in the former strait, owing to its less width. The main current does not everywhere fill the whole width of the straits; generally speaking, it takes the shortest route from point to point, so  
35 that, at a bend, it sets strongly towards the convex side, and avoids the opposite concave side altogether. Thus in every bay, whatever its extent, there is an eddy, with a countercurrent flowing northward along the shore. These eddies are sharply defined and are permanent as long as the strength of the main current is maintained. Each eddy is in the form of a branch  
40 which leaves the main current, gradually trends towards the shore and then passes northward along it, rejoining the main current in the vicinity of the northern entrance point of the bay. These eddies completely fill the spaces between the main current and the shores. In some of the more extensive bays, the eddies are double or otherwise complex in  
45 formation.

- The character of the current alters when its strength changes due to any cause. If it is stronger than usual, as for example, may be due to an increase in the strength of the north-easterly wind, it becomes a faster and narrower band, which sets into and across the wider parts of the straits  
50 as a thinner jet. Each lateral eddy then spreads, covering a wider area than usual, and increases in rate, so that an increase in the inshore countercurrent follows an increase in the rate of the main current. If, on the other hand, the current is weaker than usual, as, for example, may be due to a decrease in the strength of the north-easterly wind, or to the  
55 wind blowing from a southerly direction, the main current is retarded and becomes wider, and the larger lateral eddies must correspondingly

*Chart 224.*

decrease in width; the strength of the eddies and countercurrents is thus decreased, and in the less extensive bights, may disappear entirely. In general, the currents are more affected by changes of wind in the Dardanelles than in the Bosporus, on account of the greater width of the former strait. 5

During the winter, winds from directions between south-east, or south, and west, occur in connection with depressions travelling over or near the region. These winds, especially strong south-westerlies, by raising the water level, weaken and widen the current, as stated above. 10 If, however, the wind opposing the current is very strong, the width of the band of current begins to decrease, or may even be replaced by a weak, wind-driven, northerly flow. If the main current is thus reversed, the lateral eddies all reappear, turning the opposite way to their normal directions, with south-going countercurrents along the shores of each bay. 15 Such a complete reversal of the current is infrequent, but, when circumstances are favourable, it may take place within a few hours. The most favourable combination of circumstances is a north-easterly gale, which reduces the level of the Black sea near the entrance to the Bosporus, followed by a strong southerly wind or gale. As a rule, such a reversal occurs in the Bosporus before it begins in the Dardanelles. 20

The northerly current in the Bosporus may flow for some hours, or even a day, after the southerly wind has ceased, if a north-easterly wind does not quickly follow.

The rate of the surface current flowing out of the Black sea is naturally greatest during the season when the rivers discharge the greatest volume of water, due to the thawing of the snow, and also when winds from a northerly quarter are strongest. Both these effects coincide in the late spring and early summer. The outflow through the Bosporus, and, therefore, also through Marmara denizi and the Dardanelles, attains its greatest rate and volume in June. As the volume of water discharged by the rivers varies considerably in different years, the maximum strength of the current varies correspondingly. 25 30

Fluctuations, due to wind and pressure changes, occur in the rate of the current. These are, in general, least in summer, when the north-easterly wind is most constant, though liable to diurnal variation. 35

In the Bosporus, the current is generally stronger in the afternoon than in the forenoon. The mornings are usually calm, and the north-east wind gains strength during the day.

Other modifications of the current system occur periodically. The oscillations of water surface in confined areas, known as seiches, are known to occur in the Dardanelles, Marmara denizi, and the Bosporus; these have periods of 8, 4 and  $1\frac{1}{2}$  hours. Tides, also, have an effect but this is extremely small. 40

As a result of these various causes rapid changes in the surface currents occur at times. 45

In both the Bosporus and the Dardanelles the current is weakest at the northern entrance, where its rate is from a half to three-quarters of a knot. The rate of the current is greatest in the southern part of each strait, but the increases are not, however, regular. The average rate of the current at various positions in the Dardanelles, under normal meteorological conditions, is given in the detailed description of this current on pages 43-44; a similar description for the Bosporus is given on pages 45-48. The average maximum rate of the current in the Dardanelles, under normal conditions, is from  $2\frac{1}{2}$  to 3 knots in and southward of the Narrows; this rate increases to 5 knots under abnormal conditions. The 50 55

**Chart 224.**

corresponding rate in the narrower Bosphorus is from 4 to 5 knots from the palace of Beylerbeyi ( $41^{\circ} 03' N.$ ,  $29^{\circ} 03' E.$ ) towards Vaniköy, rising, in abnormal conditions, to 7 knots between Rumelihisari and the eastern shore opposite to it, where the current is known as Devil's current. See also page 46.

On account of the large variations in the rate of the current and the fluctuations to which it is liable, as described above, estimates of the mean rate of the current along the whole course of either strait are not very reliable. As a rough approximation, the mean rate, under normal conditions, can be taken as from 2 to  $2\frac{1}{2}$  knots in the Bosphorus and from one to  $1\frac{1}{2}$  knots in the Dardanelles. In general, there is no direct relation between the depth of the channel and the rate of the surface current at any given place.

The following observations, taken at various positions in the straits, indicate the alterations in the rate and direction of the currents under different wind conditions. The position of each observation is in the main flow of the current, in line with the places named. For the direction of the current, "S" means the normal flow southward through the strait, and "N" means the reversed, northward flow.

Position	Wind direction and force	Surface current rate and direction	Wind direction and force	Surface current rate and direction
<b>The Bosphorus:</b>				
Garipçe burnu—Poyraz . . . . .	$225^{\circ}-4$	0.4 S.	$010^{\circ} 1$	0.7 S.
Büyükdere—Umuryeri limanı . . . . .	$225^{\circ}-2$	0.8 S.	$290^{\circ} 2$	1.3 S.
Arnavut burnu—Vaniköy . . . . .	$225^{\circ}-3-4$	0.4 N.	$020^{\circ} 4-5$	2.2 S.
Kuruçesme—Chengelköy . . . . .	— 0	1.0 S.	$020^{\circ} 3-4$	2.4 S.
Dolma bahçe—Üsküdar . . . . .	$180^{\circ} 2$	1.2 S.	$056^{\circ} 6-7$	4.1 S.
Saray burnu—Üsküdar . . . . .	$200^{\circ}-3$	0.2 S.	$\begin{cases} 0 \\ 360^{\circ} 2-3 \end{cases}$	$\begin{cases} 2.2 \\ 1.9 \end{cases}$ S.
<b>The Dardanelles:</b>				
Gelibolu limanı—Lapseki limanı . . . . .	$225^{\circ}-5$	0.2 N.	$\begin{cases} 034^{\circ}-3 \\ 045^{\circ}-4 \end{cases}$	$\begin{cases} 1.2 \\ 1.0 \end{cases}$ S.
Karakova burun—Gocuk burnu . . . . .	$\begin{cases} 225^{\circ} 3-4 \\ 225^{\circ} 6-7 \end{cases}$	$\begin{cases} 0.6 \\ 0.6 \end{cases}$ S.	$\begin{cases} 0 \\ 045^{\circ} 7 \\ - 0 \end{cases}$	$\begin{cases} 0.4 \\ 1.2 \\ 0.5 \end{cases}$ S.

When the surface current is flowing in the normal south-westerly direction, there is a transition layer between it and the under-current. The depths to which the surface current extends is considerably greater at the northern ends of the Bosphorus and the Dardanelles, than at their southern ends. Different authorities are not in full agreement as to the average depth to which the surface current extends, but the following is an approximation:—At the northern end of the Bosphorus, from 22 to 27 fathoms ( $40_{m2}$  to  $49_{m4}$ ); and at its southern end, from 33 feet to 11 fathoms ( $10_{m1}$  to  $20_{m1}$ ). At the northern end of the Dardanelles, 25 fathoms ( $45_{m7}$ ); and at its southern end, 33 feet ( $10_{m1}$ ). The thickness of the transition layer is from 6 to 30 feet ( $1_{m8}$  to  $9_{m1}$ ) in the Bosphorus, and from 6 to 24 feet ( $1_{m8}$  to  $7_{m3}$ ) in the Dardanelles.

The under-currents are complex and have not yet been fully determined; they are subject to considerable variation. Fundamentally, they resemble the surface current in consisting of a central band of main current, with lateral eddies between it and the sides of the straits, both the main current and the eddies setting in the reverse direction to the surface currents and eddies. A reversal in the direction of the surface current permeates downward very slowly, and the main body of the under-current is little affected.

*Chart 2429.*

**The Dardanelles.**—The following detailed description of the currents refers unless otherwise stated, to the normal meteorological conditions of the strait, namely, a north-north-easterly wind of force from 2 to 3 in the channel, with the atmospheric pressure from 2 or 3 mb. higher over the Black sea coast of Anadolı than at İzmir. 5

From Galata burun southward, western edge of the current either runs along the north-western shore, or is separated from it only by narrow eddies in the various small bights. The main current fills the bight north-eastward of Uzun burun ( $40^{\circ} 16' N.$ ,  $26^{\circ} 30' E.$ ). The eastern edge of the main current touches the south-eastern side of the strait at only six places: between Gelibolu and Çardak burnu, near the entrance from Marmara denizi; between Nara burnu and Bigalı kalesi; at Çanakkale; in the vicinity of Kepez burnu; and between Seddülbahir and Kum burnu, at the south-western entrance of the strait. At these places the main current, therefore, fills the whole width of the strait. 10 15

*Chart 2429, with plan of the Narrows.*

In Gelibolu boğazi, the northern entrance to the Dardanelles, the rate of the main current is from one to  $1\frac{1}{2}$  knots, being less near the sides than in mid-channel. From a position off Galata burun to a position a short distance south-westward of Gocuk burnu, the bulk of the central part of the main current has a rate of from  $1\frac{1}{2}$  to 2 knots. Along a narrow strip on the axis of the current, however, the rate is only from one to  $1\frac{1}{2}$  knots. Off Gocuk burnu, but nearer the north-western side, there is a small area in which the current exceeds 2 knots. Thence south-westward to Akbaş limanı, the rate of the central part of the current is reduced to from one to  $1\frac{1}{2}$  knots. 20 25

In the Narrows, between Kilya koyu and Nara burnu, the main current sets west-south-westward across the bank extending off the latter and strikes the western side of the strait southward of Eceabat, where it is deflected by the coast and sets south-south-eastward towards the narrows off Çanakkale, southward of which it resumes its original south-westerly direction. This is the only large change in its direction in the whole passage of the current through the strait. 30

From Kilya koyu ( $40^{\circ} 12' N.$ ,  $26^{\circ} 22' E.$ ) to the south-western entrance of the strait, the rate of the central part of the current is not less than from  $1\frac{1}{2}$  to 2 knots, and exceeds this over extensive stretches. From a short distance northward of Çanakkale, to a position off the middle of Erenköy limanı, the rate exceeds 2 knots, and, over the greater part of this reach, from Çanakkale to a position off Karanfil burnu the rate is from  $2\frac{1}{2}$  to 3 knots. The current in the Dardanelles has its greatest rate about one mile southward of Çanakkale. In the narrowest part of the strait, off Çanakkale, the rate is greater near each side of the channel than at its centre. South-westward of Hisarlık burnu, the rate of the current nearer the north-western side again increases to between 2 and  $2\frac{1}{2}$  knots and continues thence south-south-westward into the Ægean sea. Between Seddülbahir and Kum burnu, this increased rate obtains over about two-thirds of the width of the strait from its north-western side. 40 45

Strong northerly or north-easterly winds increase the rate of the current, especially in the Narrows where, during the first few days with such winds, the rate between the old castles of Çanakkale kalesi and Kilitbahir has been known to reach 5 knots. During strong south-westerly winds, the current is sometimes reversed in direction, but this is an infrequent occurrence. 50

**Eddies.**—With the exception of the eddy in Gelibolu limanı, on the north-western side, all the more extensive eddies and counter-currents 55

*Chart 2429, with plan of the Narrows.*

are on the south-eastern side. Advantage may be taken of the eddies in some of the bays by a vessel proceeding north-eastward, but, off the south-eastern side, she would have to pass through the full strength of the main current when rounding the points.

From the south-western entrance of the strait to Çanakkale, only a few small eddies are formed between the main current and the north-western side. The widest of these is that which fills Anit limanı. There is an eddy in the bight immediately north-eastward of Hisarlık burnu, and another in the bight off Karanfil burnu. A narrow eddy extends about  $2\frac{1}{2}$  miles south-westward from Kilitbahir, and about  $1\frac{1}{2}$  cables offshore at its widest part.

Off the south-eastern side, a large system of eddies occupies the whole of Erenköy liman, extending the whole distance from Kum burnu to the northern entrance point of Kepez liman; within from a half to three-quarters of a mile from the south-eastern side opposite Karanfil burnu, a countercurrent sets for a short distance at a rate of more than half a knot. Thence to Kanlidere burnu the main current touches the south-eastern side. An almost constant eddy occupies Sarisiglar liman, but this bay is so obstructed by shoals that the eddy is not of much value to a vessel proceeding north-eastward.

Northward of Çanakkale, there is a small, double eddy in Kilya koyu, on the north-western side, and there are three eddies in succession off the eastern side, occupying the whole distance between Çanakkale and Nara burnu. Of these three eddies, the southernmost occupies Dardan liman, the bay north-eastward of Çanakkale and the northernmost occupies Nağra liman.

North-eastward of Kilya koyu, on the north-western side, there is a small eddy in Akbaşı limanı, no eddy in the bight north-eastward of Uzun burun (page 94), and a comparatively small eddy filling the bight off Karakova burnu. The eddy which occupies Gelibolu liman is the most extensive on the north-western side. North-eastward of the town of Gelibolu, a small eddy occupies Bağcesme limanı. On the south-eastern side, a large system of eddies occupies the bight between Abidos burnu (page 93) and Gocuk burnu, and extends nearly one mile offshore. From about 3 to 5 cables off the mouth of Yapıldak cay (page 94) the countercurrent has a rate of over half a knot; it sets north-eastward along the shore, sometimes at a considerable rate, as far as Kunduzkaya, and though it continues nearly as far as Gocuk burnu, it becomes too narrow to be of further use. Between Gocuk burnu and Lapseki limanı there are probably small eddies or slack water in the small indentations on the south-eastern side. Lapseki limanı and Çardak liman are occupied by weak eddies, but these are by no means regular.

*Chart 224.*

**Marmara denizi.**—The general set of the current in this sea is westward towards Gelibolu, but there are a few slight variations, owing to its islands and to the sinuosities of its coasts. The currents are, in general, much weaker than those in the Bosphorus and the Dardanelles. The mean rate is considered to be slightly less than half a knot.

The current from the Bosphorus very quickly decreases in rate on entering Marmara denizi. It spreads out in the shape of a fan, the southern branch setting towards Kızıl adalar, and through their channels, and thence towards İzmit körfezi, round which it runs from west to east along its southern shore, and from east to west along its northern shore. Between this current and the eastern shore of Marmara denizi, from the southern entrance of the Bosphorus to Tuzla, there is a zone of counter-

*Chart 224.*

current which sets towards the Bosphorus, and within this, again, there is a narrow strip of current setting southward close inshore past Bostancı as far as Dragos (Mal Tepe) burnu.

The central branch takes a southerly direction towards Boz burnu, trends eastward along the southern shore of İncir Limanı (İndjir liman), and then westward along its northern shore, setting out very strongly westward abreast Armutlu village and past Boz burnu.

Lastly, the northern branch takes a south-westerly direction, leaving an area between Ahirkapı burnu and Yeşilköy burnu in which the current is generally weak, and even, sometimes, there is an east-going eddy or countercurrent.

In the channel northward of Marmara adası the current generally sets west-south-westward, and its strength is much increased in the vicinity of Hosköy (Hora), where its maximum rate is one knot. The current here runs entirely along the European shore and in the centre, the Asiatic side being protected by Pasa Limanı adalar and Marmara adası. Many vessels have been wrecked on this shore between Eriklice (Heraclitza) and Gelibolu owing to the current having a tendency towards the coast, and to the haze, which, hanging over the lower land fronting the high land within, gives the impression that a vessel is farther offshore. Very few vessels have been wrecked on the Asiatic coasts.

In the lesser channel southward of Marmara adası, the current sets about west by north: but also flows through Narlı köy (Rhoda) and Avşar (Arablara) channels between the islands southward, and then eastward along the northern shore of Erdek körfezi, round which it sweeps before resuming its westerly course along the southern shore towards the Dardanelles.

Any seasonal or other cause which strengthens or weakens the currents in the Bosphorus or the Dardanelles will likewise affect those in Marmara denizi. Thus, during a north-easterly gale, in a position about 8 miles southward of Ereğli, a current has been observed to set in a west by south direction at a rate of one knot. During strong or prolonged southerly or south-westerly winds, on the other hand, when the current in the straits is checked or even reversed in direction, the currents in Marmara denizi are weakened and may set in any direction. A fresh south-westerly wind has been observed to reverse the usual southerly flow through Narlıköy Geçiti to a northerly set of nearly half a knot. An east-going eddy occurs off Yeşilköy burnu during a south-westerly wind when the current from the Bosphorus first meets the wind and swell; no eddy or countercurrent occurs westward of that point. See also page 117.

*Chart 1198.*

**The Bosphorus.**—The following detailed description refers, unless otherwise stated, to the normal meteorological conditions of the Bosphorus, which are a north-north-easterly wind of force from 2 to 3 in the channel, which the atmospheric pressure from 2 to 3 mb. higher on the Black sea coast of Anadolu than at İzmir.

Since the Bosphorus is narrower and more tortuous than the Dardanelles, the course of the main current is more complicated in the former than in the latter strait, it being more frequently diverted from one side of the strait to the other by the various projecting points.

The main south-going current from the Black sea strikes the western side of the strait at Garipçe burnu ( $41^{\circ} 13' N.$ ,  $29^{\circ} 07' E.$ ) at a rate of  $\frac{1}{2}$  to one knot, and occupies the whole width of the strait between this point and Poyraz point.

Between Fil burnu and Dikilikaya, the axis of the current lies nearer



*Chart 1198.*

the north-western side, and the rate increases to slightly over one knot. The current strikes the south-eastern side at Kavak burnu with a rate between  $1\frac{1}{2}$  and 2 knots.

- 5 From the vicinity of Acartabya to Selvi burnu the axis of the current is nearer the eastern side and the rate between one and  $1\frac{1}{2}$  knots. The western edge of the main current strikes the north-western side at Mesar burnu. It does not enter Büyükdere limani but sets directly on to Kireçburnu, and also over Umur banki.

- 10 Between Selvi burnu and Tarabya koyu the current fills the whole width of the strait, at about one to  $1\frac{1}{2}$  knots; farther southward it leaves the eastern side and strikes the shore in the vicinity of Yeniköy.

- Southward of İstinye koyu, as far as Kandilli ( $41^{\circ} 04' N.$ ,  $29^{\circ} 03\frac{1}{4}' E.$ ), the current occupies the whole strait, but from Kandilli to the southern entrance to the Bosphorus it continues mainly on the eastern side at rates between 3 and 4 knots. But in abnormal conditions the rate may attain a velocity of 7 knots between Rumelihisari ( $41^{\circ} 05' N.$ ,  $29^{\circ} 03' E.$ ) and the eastern shore; *see* below.

- Eddies.**—*Istanbul to Kanlıca.*—An extensive area, between the north-  
20 western side of the strait and the main current, extending from the entrance to Haliç north-eastward to Arnavut burnu ( $41^{\circ} 04' N.$ ,  $29^{\circ} 03' E.$ ) where the main current strikes this side, is occupied by eddies.

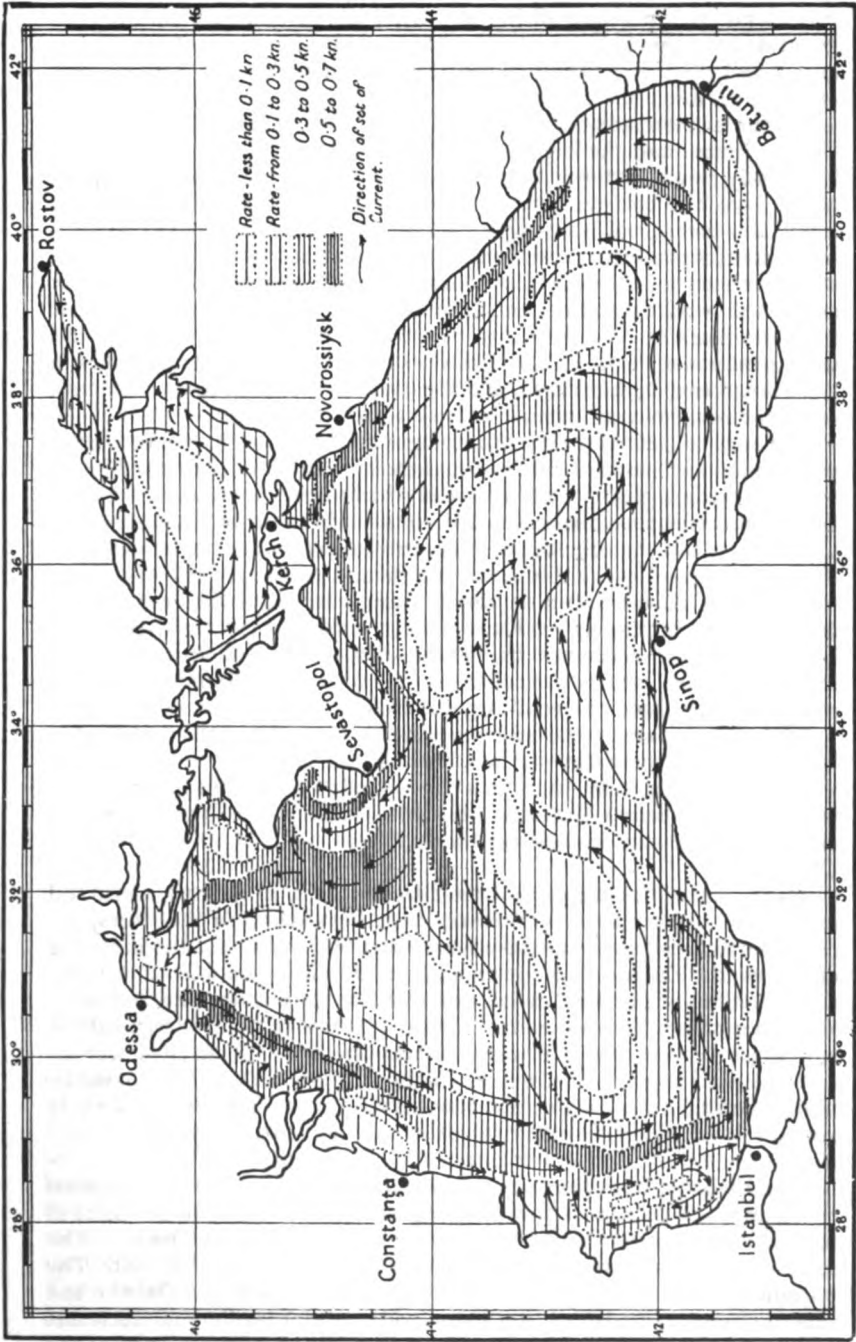
- Another eddy fills Bebek koyu. The countercurrent, which sets along the shore north-eastward from Galata to Defterdar burnu, is strongest  
25 in the afternoon and decreases in strength late in the evening, in conformity with the diurnal variation in the strength of the main current, *see* page 41. The normal rate of the countercurrent, close inshore, is greater than half a knot.

- During south-westerly winds, the eddy in the bights between Defterdar  
30 burnu and Arnavut burnu may disappear completely, and, in this case, the main current occupies the whole width of the strait here.

- In the southern part of the strait, the areas containing eddies are much less extensive off the eastern side of the strait than off its western side. In the bight northward of Üsküdar, there is an eddy, with a narrow  
35 band of countercurrent setting north-eastward along the shore; with south-westerly winds this countercurrent extends as far as the middle of the strait. The south-eastern part of the strait between Kızkulesi and Menmetçik burnu is rarely used by vessels proceeding northward. The main current sets full on to the point at Kandilli, but there is a small eddy  
40 off Anadoluhisari, and slack water close inshore along the somewhat indented stretch of coast thence to Kanlıca.

- In the narrowest part of the strait, between Rumelihisari and Anadoluhisari, the main current sometimes becomes very strong and is then known as the Devil's current. The Turkish authorities have recorded a rate of  
45 7 knots here on rare occasions. Such extreme rates are probably due to a combination of circumstances, such as the setting in of a northerly gale after the sudden cessation of strong southerly winds. Under normal conditions, the current in the strait does not attain its maximum rate in this vicinity, *see* page 42.

- 50 *Kanlıca to northern entrance.*—On the western side, there is a small eddy in the outer part of İstinye koyu. There is a complex system of eddies in Büyükdere koyu; a countercurrent sets across the middle of this bay towards Büyükdere and thence north-eastward along the shore towards Mesar burnu, which point, however, it does not reach. In the  
55 southern part of Büyükdere koyu, the normal rate of this countercurrent exceeds half a knot. When the main current is stronger than usual, and



GENERAL SURFACE CURRENT CIRCULATION OF THE BLACK SEA AND SEA OF AZOV.

*Chart 1198.*

therefore narrower, an eddy is sometimes formed off Kirec burnu and may extend to a position off Mesar burnu, and in this case another eddy is formed in the bight north-eastward of the latter point, extending  
 5 nearly to Telli Tabya burnu. This is likely to occur during strong north-easterly winds.

On the eastern side, in Pasabahçe koyu, which includes İncir liman, Beykoz liman, and the bight south-eastward of Selvi burun, there is a large eddy, which extends 4 cables offshore in the more extensive parts  
 10 of the bay. The countercurrent formed by this eddy sets along the shore from İncir liman, and is strongest in Beykoz liman, where its rate exceeds half a knot; it produces overfalls over İncir bank. If the water level in the strait has been raised by a spell of southerly winds, especially if of gale force and if the wind then shifts suddenly northward and blows hard, water  
 15 from the Black sea is driven into the strait with such force that its sets with great strength on to Köybaşı, causing an unusually strong eddy in İncir liman and Beykoz liman, and the countercurrent in these bays may, in such circumstances, extend halfway across the strait.

The edge of the main current impinges on Selvi burun, but in Umur-  
 20 yeri liman, northward of this point, there is an eddy of considerable extent. There is a slight countercurrent which assists a vessel in working up to Selvi burun and eastward of Umur bankı as far as the shore near Calilik tepe, but the edge of the main current sets on to the latter point. The main current is not felt in the central and northern parts of the bay  
 25 southward of Kavak burnu, in which there is an eddy. The edge of the main current, impinging on Kavak burnu, separates this eddy from the large eddy which occupies the whole of Keçilik koyu and which, at times, separates into two smaller ones. A countercurrent sets northward along the shore of Keçilik koyu at a rate of about a quarter of a knot.  
 30 Fil burnu separates the eddy in Keçilik koyu from the small eddy which occupies the bight southward of Poyraz burnu.

On the western side, there is a narrow eddy in Büyük liman, and a weak counter-current generally sets northward in the bights between Garipçe burun and Rumeli lighthouse.

*Chart 2214.*

**Black sea.**—The currents of the Black sea are, in general, weak and inconstant. They are due to two causes: the outflow of the rivers, the bulk of which enters the north-western part of the sea, and the influence of the wind. Variations in the amount of the discharge from the rivers,  
 40 and variations of the wind distribution, due to the passage of depressions and other causes, may effect the normal currents to a very large extent, and, in some areas, may even reverse their directions. A detailed account of the general counter-clockwise circulation is given below, but it must be understood that it is only rarely that this circulation is to be found in its  
 45 entirety over the whole extent of the sea. See also diagram on page 47.

The discharge from Dneprovskiy liman flows westward along the coast to Odessa, and thence southward along the western shore to the delta of River Danube, receiving on its way the outflow of Reka Dnestr. The  
 50 main rate of this current is from a half to three-quarters of a knot. The current then receives a great accession of water from River Danube and sets south-south-westward, but it gradually becomes wider and decreases in strength, so that, off Constanța, its rate is less than half a knot. Here its colour is yellowish-green, from the outflow of River Danube. In the  
 55 latitude of Varna, the current is joined by a weak current which sets west-south-westward from the southern coast of the Crimea, and the

*Chart 2214.*

combined current then sets southward and south-south-eastward to the northern entrance of the Bosphorus.

The current does not enter the extensive bight between Nos Kaliakra and the Bosphorus. On the parallel of Serves burnu, a weak branch curves away from the main current towards the shore, along which it passes northward as a countercurrent. This countercurrent has been observed to flow along the shores of Balchik (Baljik) bay; southward of Nos Kaliakra, it trends westward and rejoins the main current. The rate of this countercurrent is from about a quarter to half a knot.

Of the great body of water flowing towards the Bosphorus, only a part can escape through that strait. The remainder continues in an east-north-easterly direction along the coast of Anadolu at a rate of from a half to three-quarters of a knot, gradually decreasing to from about a half to a quarter of a knot.

Off Kerempe burnu, the current divides: the main branch continues eastward as a narrow band close inshore; the broader branch, which is weak, sets north-eastward towards the Crimea, and when reaching a position about 60 miles southward of Mys Sarych, it, in turn, divides into two branches, both of which are weak. The narrower branch sets northward and north-westward towards the Crimean coast; and the wider branch sets eastward and south-eastward, and rejoins the main current near Bafra burnu, on the southern shore.

Thence the joint current continues eastward along the southern shore to Batumi, being augmented along its course by the outflow of the various rivers which flow into the sea along this stretch. From a position off Batumi, the main current trends northward and north-westward, following the trend of the Caucasian coast. Here the current is augmented by the outflow of Reka Rion and other rivers from the mountains, and has a rate of from a half to three-quarters of a knot.

In the vicinity of Pitsunda and Sochi, a very weak current branches off south-westward and flows towards Giresun, on the southern shore.

In the neighbourhood of Mys Utrish, the main current may be joined by a weak branch which sometimes sets northward from Vona limani, on the southern shore.

Thence the combined current trends westward and, after receiving the outflow of the southern branch of Reka Kuban', passes southward of Kerchenskiy proliv, from which it receives an accession of water from the Sea of Azov in certain seasons, or under the influence of north-easterly winds, and also receives the main outflow of Reka Kuban'. Thence the current sets west-south-westward along the Crimean coast to Mys Sarych, gradually decreasing in width. The strength of this section of the current depends greatly on the wind and on the strength of the outflow from Kerchenskiy proliv, if any.

Off Mys Sarych, where the main current is joined by the branch, described above, setting northward from the coast of Anadolu, a narrow branch separates from the main current and sets north-westward, and then northward and north-eastward into Kalamitskiy zaliv. The main stream continues westward to about the meridian of  $32^{\circ} 40'$  E. and thence trends north-westward and, later, northward, setting towards Mys Tarkhankut. A weak current, with a rate of from about a quarter to half a knot, branches off, however, where the main stream turns north-westward, and, setting west-south-westward, joins the south-going current in the vicinity of Varna, as mentioned on page 48.

The main current, setting towards Mys Tarkhankut, throws off a narrow branch westward on the parallel of Mys Lukull, with a rate of

*Chart 2214.*

from about a quarter to half a knot. Another branch sets eastward and south-eastward towards Yevpatoriya. Thence the main current sets northward past Mys Tarkhankut, across the entrance of Karkinitiski  
5 zaliv to a position off the village of Klarovka, where it divides into two branches. One of these branches sets along the southern side of Ostrov Dzharylgach into the eastern part of Karkinitiski zaliv, round which it flows in a clockwise direction, passing out of it and westward along the southern side of Karkinitiski zaliv towards Mys Tarkhankut. The  
10 other branch follows westward along the southern side of Tendrovskaya kosa, off the north-western extremity of which it trends northward and joins the current setting out of Dneprovskiy liman, thus completing the circulation.

The currents in the Black sea thus consist, essentially, of a main  
15 circulation setting counter-clockwise along its shores, with several branches connecting its various parts.

The strength and constancy of this circulation is greatest, as a whole, after the melting of the snows in late spring and early summer, this being the season when the discharge from the rivers is greatest. In this season  
20 an increase in the rate of the current may occur, particularly off the mouths of the large rivers; this may also occur after periods of heavy rain at any time of the year.

In late summer and autumn, when the volume of water discharged by the rivers is relatively small, the circulation, as a whole, is weaker and  
25 more subject to changes due to the influence of the wind. The largest variations in the current are found in the north-western part of the sea; here, especially during the spring, the outflow of River Danube is often felt a considerable distance offshore, causing a considerable easterly, or even north-easterly, set.

30 The currents in the vicinity of the northern entrance of the Bosphorus, with the exception of the indraught into that strait, are variable and are influenced by the prevailing wind.

Off Mys Tarkhankut, and in the entrance of Karkinitiski zaliv, the current sets eastward, at a considerable rate, with westerly winds, and  
35 westward with easterly winds, in place of the normal northerly set.

Observations indicate the probability that, at times, there are local increases in the rate of the general circulation, especially off the more prominent headlands, and notably off Mys Meganom, Mys Khersones and Mys Tarkhankut, in the Crimea. At such times, the rate may increase to  
40 as much as 2 knots.

The rates of the currents as given above in the description of the general circulation are mean values, and are subject to considerable variation, as already stated. Of 59 observations of currents in the Black Sea obtained during the period from 1910 to 1938, nearly half did not  
45 exceed a rate of half a knot.

*Local currents.*—Local current systems are found off the mouths of the rivers. As a rule, the river water flows out of the mouth in a direction at right angles to the trend of the coastline, thence, it gradually swerves to the right and may even turn so much towards the shore as to produce  
50 an eddy setting towards the mouth. The best example of this is off the mouth of Reka Chorokh, near Batumi described on page 416. All such systems are greatly affected by variations in the volume of water discharged by the rivers and also by changes of the wind.

*Countercurrents.*—Countercurrents, setting in a direction contrary to  
55 that of the main current, occur between the main current and the shore

*Chart 2214.*

in many places; they are very irregular, and almost entirely dependent upon the wind.

In the western part of the Black sea, the countercurrent which sets northward along the coast from a position near Serves burnu, past Burgaski zaliv has already been mentioned in the description of the main circulation. This is a more permanent feature of the circulation, but is, no doubt, largely dependent on the rate of the main southerly current and the wind blowing at the time. Farther northward a countercurrent of unusual type has been observed to flow northward through the course of the main southerly current from a position south-eastward of Nos Kalialkra. It weaves its way northward in and out as a band of current, sometimes on the surface and sometimes below the main current, and is variable in strength and in direction. The existence of this "current within a current", when at the surface, is said to be attested by a pronounced difference in the colour of the water, and by a well-marked line of scum. Sometimes it consists of two bands separated by from one to  $1\frac{1}{2}$  cables. This current continues past River Danube delta to a point about midway between it and Dnestrovskiy liman. A part, under the surface, branches off in a north-easterly direction southward of Ostrov Zmeinny (Insula Șerpilor or Fidonisi).

In the eastern part of the Black sea, countercurrents may be found in the following regions:—off the southern shore between Kerempe burnu and Batumi; between Batumi and Poti; off the Caucasian coast between Mys Sukhumiyskiy and Mys Pitsunda; between Mys Utrish and the entrance to Kerchenskiy proliv; and along the south-eastern coast of the Crimea from Mys Meganom to Mys Sarych and thence to Mys Feolent.

*Chart 2216.*

**Kerchenskiy proliv.**—The current may flow in either direction through Kerchenskiy proliv, either into or out of the Sea of Azov. The southerly flow predominates, especially in the spring; but, towards the autumn, this outflow from the Sea of Azov lessens as the volume of water discharged by the rivers decreases, and the water level in that sea is correspondingly lowered. The northerly flow, into the Sea of Azov, usually reaches its maximum in November. The currents flowing either way through the strait are, however, liable to be modified by the wind prevailing at the time. An under-current sometimes flows through the strait in the reverse direction to the surface current. For further details, see page 298.

*Chart 2234.*

**Sea of Azov.**—The currents in the Sea of Azov are due to the combined effects of two independent causes: the discharge from Reka Don into Taganrogskiy zaliv and the currents caused by the action of the wind.

The outflow from Reka Don, issuing from Taganrogskiy zaliv, produces a current flowing counter clockwise round the Sea of Azov, following the coastline. This current flows westward along the northern shore of the sea, forming a series of eddies within the projecting point and spits. Off Biryuchiy ostrov, the current trends southward along Arabatskaya strelka, and is strengthened, when conditions are favourable, by the outflow from Sivash or Gniloye more. This outflow is most marked in the spring, when large volumes of water from melted ice are discharged from Sivash, and in autumn, during the constant, fresh westerly winds which then prevail. Thence the current is diverted eastward along the southern shore of the Sea of Azov, and a part of it may flow southward through Kerchenskiy proliv into the Black sea. Thence the current

*Chart 2234.*

continues eastward, and then northward along the eastern shore of the Sea of Azov, where it is strengthened by the outflow of Reka Kuban' and other rivers. Eddies are formed within the prominent points or spits.

- 5 The mean rate of the currents in the Sea of Azov is weak and rarely reaches half a knot. The existence of eddies which always carry the silt washed away from the shores in a definite direction, explains the configuration of the spits and flats fringing the shores of this sea.

- The rate of the currents produced in the Sea of Azov by the prevailing winds is much greater than that produced by the outflow of Reka Don, so that, for practical purposes of navigation, it may be said that the currents in this sea are wholly dependent upon the prevailing winds. These prevailing winds are either north-easterly or south-westerly (see page 57) and, in either case, they produce considerable changes of direction, as well as of rate, in the currents.

- With a north-easterly wind, the normal counter-clockwise circulation has imposed upon it a wider current, which sets in a south-westerly direction through the central part of the sea towards Kerchenskiy proliv; this current may attain a rate of  $1\frac{1}{2}$  knots. South-westerly winds produce a similar current in the opposite direction, and, after a gale from this direction, this current may attain a rate of 2 knots.

- South-westerly winds thus have the effect of enhancing the normal counter-clockwise circulation in the eastern half of the sea. North-easterly winds, however, produce a current which sets from the stretch of coast between Belosarayskaya kosa and Osipenko towards Kerchenskiy proliv, whilst the normal current still continues to set in a northerly direction along the eastern shore of the sea, but is deflected closer inshore.

The rate of the eddies within the various spits may be increased by the action of the wind, but observations to confirm this are lacking.

- After the wind has ceased to blow, or even while it is still blowing the change of water level produced by it in this comparatively small sea gives rise to a current flowing in the opposite direction, which readjusts the water level. This peculiarity should be taken into account when navigating in the fairway in Taganrogskiy zaliv, the greater part of which fairway is so situated that the coastal currents set right across it, and may set a vessel on to one or other of its sides.

- In Taganrogskiy zaliv, a westerly set prevails, especially during the spring, when there is a large outflow from Reka Don. During the summer, westerly and easterly currents are almost equally frequent, though, in July, due to the prevalence of westerly winds, the current is mainly easterly. The preponderance of westerly current is again established in August, with the commencement of the autumn rains. The rate of these currents is about a quarter to half a knot.

- Fresh westerly or easterly winds, which drive the water, respectively, into or out of the gulf, quickly set up corresponding currents therein. The easterly current attains a rate of about  $1\frac{1}{2}$  knots in the western part of the gulf, and of about three-quarters of a knot in its eastern part. The westerly current attains a rate of about  $1\frac{1}{2}$  knots throughout the gulf, being slightly stronger in its western part. As soon as the wind ceases, however, the current immediately begins to flow in the opposite direction in order to restore the water level.

- The following table gives the frequency, expressed in percentages of the total number of observations, of westerly and easterly currents experienced off Beglitskiy light-buoy, which is moored about 6 miles southward of Beglitskaya kosa.

*Chart 2234.*

Month	Easterly current	Westerly current	No current
May . . . . .	21	43	36
June . . . . .	27	29	44
July . . . . .	28	24	48
August . . . . .	25	33	42
September . . . . .	25	30	45
October . . . . .	27	32	41

**CLIMATE AND WEATHER.—General remarks.**—Articles 1, 3 and 4 on “General Meteorology” in N.P.100 *The Mariners’ Handbook* apply to this volume and should be read in conjunction with the following text. Weather reports and forecasts for the area covered by this Pilot are issued regularly from various transmitting stations which also broadcast warnings, as appropriate. Details of the information provided, together with frequencies, times of transmission, etc., are to be found in the Admiralty List of Radio Signals, Vol. III, while Vol. IV gives details of the meteorological stations. 5

In the summer months the climate of this region resembles that of the Mediterranean, being mainly fine, hot and sunny. At this season conditions are remarkably uniform in all parts and temperatures are as high in the north as in the south. 10

The contrast between summer and winter is most marked. Even in the south, winters are colder than in the Mediterranean, and in the north they are very cold indeed. Ice forms in late winter and spring in the coastal waters from about the Danube delta to near Kerchenskiy proliv but is usually absent from the southern coasts of the Crimea. 15

Most of the unsettled weather occurs in the winter months, being associated with the eastward movement of depressions across the region. Average wind speeds are highest in January and February (about 16 knots) and gales (force 8) are then at their most frequent (about 5 per cent of all the wind observations, in the west and north-west of the region). 20

Fog at sea is rare in summer and is most frequent (about 2–5 per cent of the observations) in spring. In the more sheltered ports fog is most frequent in winter. At Odessa which is more prone to fog than most other ports, fog has been reported on 8 days per month in December. 25

Rainfall amounts are small on the north-western coasts but are considerable in the south-east, near Batumi.

**Pressure and Depressions, Fronts.**—Average values of atmospheric pressure at coastal stations in this region are chiefly influenced by the large seasonal fluctuation of pressure over Asia. Pressure is highest in winter when the centre of maximum pressure is over Siberia. A ridge then extends westwards to the Ukraine. Pressure over Asia is lowest in summer and the centre of lowest pressure is then over Pakistan. Coastal stations throughout the region reflect this seasonal fluctuation and their average monthly pressures are highest in one of the months October to January and are lowest in July. At Odessa, the average monthly pressure is highest (1,021 mb.) in November and is lowest (1,012 mb.) in July. At Batumi, the monthly average is highest (1,020 mb.) in January and lowest (1,011 mb.) in July. 30 35 40



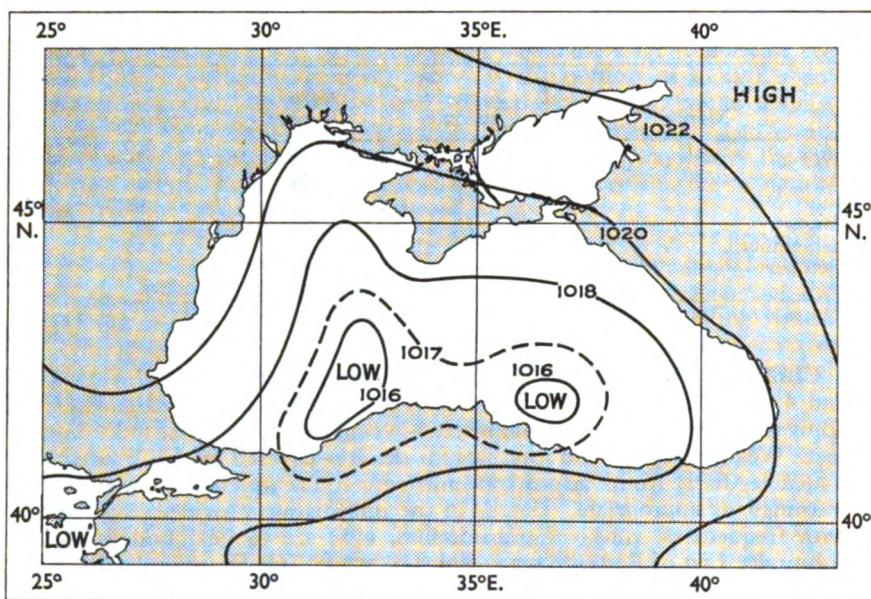


Fig. 1. Mean monthly atmospheric pressure (mb) — January

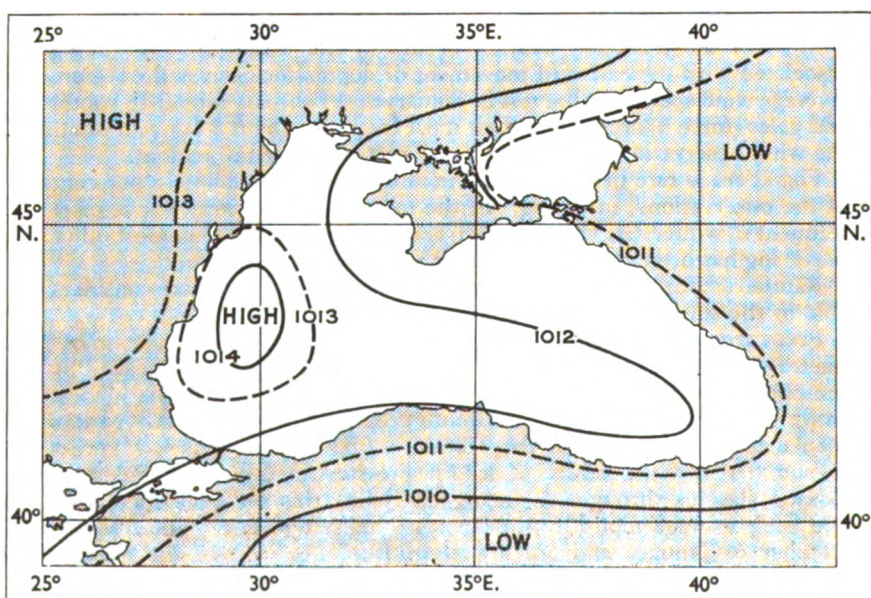


Fig. 2. Mean monthly atmospheric pressure (mb) — July

Figs. 1 and 2 illustrate the distribution of average barometric pressure (in millibars) for the months January and July respectively. In winter the average pressure is high to the north and to the north-east of the region and low to the south over the Mediterranean. In summer the overall picture is one of low pressure to the east and south and high pressure to the west in an extension of the Azores anticyclone. The overall picture, however, is complicated by the tendency for the pressure to be lower over the sea than over the land in winter, and to be higher over the sea than over the land in summer.

In a general way the pressure distribution illustrated for January is representative of the winter half year, October to March. Conditions change rapidly in April on account of the equalisation of pressure between land and sea, and the general slackening of pressure gradients over the continent. Conditions in May already approximate to the summer situation so that the pressure distribution from May to August may be regarded as being roughly approximate to that depicted in Fig. 2 for July. In the autumn, rapid changes, usually culminating in late September and early October, lead to a return to the winter situation.

Besides the seasonal fluctuation in pressure, there is a small daily (diurnal) variation whereby the average pressure has maximum values at about 1000 and 2200 and minimum values at about 0400 and 1600 local time. The total amplitude of this variation, as measured at Istanbul, is, however, only about 1 mb.

The following diagram gives the equivalence between millibars and inches of mercury:—



The pressure distribution on any given occasion is likely to differ considerably from the average monthly conditions just described. Particularly in the winter half year (October to March) the region is affected by depressions which travel in a generally easterly direction across the area. (For a general description of the nature of depressions see article on "Lows" in N.P. 100 *The Mariners' Handbook*). Fig. 3 illustrates some of the more usual tracks of depressions. The three principal paths of approach are (1) from the Mediterranean, moving north-eastward over or near Istanbul, (2) eastward over Bulgaria or Rumania, and (3) south-eastward to the north-western part of the Black sea. Their subsequent path is most frequently either north-eastward, passing somewhere near Rostov-na-Donu, or eastward, north of Batumi. On rare occasions pressure may fall well below 1,000 mb. in a depression over the Black sea but for the most part the pressure is appreciably higher. Depressions may vary considerably in their speed of advance but, on the average, their rate of progress is about 20 knots.

Most depressions have fronts associated with them. (For a description of fronts see article on "Lows" in N.P. 100 *The Mariners' Handbook*). Except in the north in winter, there is a tendency for cold fronts to be more active than warm fronts. The cold front is commonly marked by a more or less abrupt veer of wind, usually from a direction between south and west to one with a northerly component. This is accompanied by a decided drop in temperature and a rise in the barometer, and often by rain or snow. Winds often become strong in the neighbourhood of the



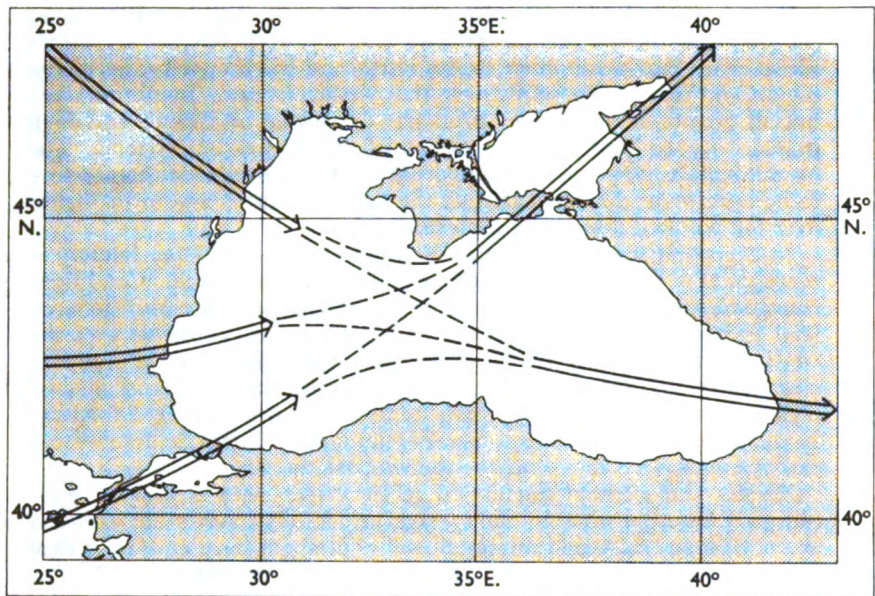


Fig. 3. Principal depression tracks

front and the passage is sometimes marked by a squall. Warm fronts are usually less well defined, but in the north in winter their arrival may be accompanied by thick low cloud, precipitation and sometimes, fog.

- Winds and Gales.** (*more than 20 miles from the coast*).—Over much of the open sea there is a reasonably good accord between the predominant wind directions deduced from ships' reports, and the expectations based on considerations of average atmospheric pressure. In other parts, notably in the south central area, the relatively few ships' observations available do not agree well with the expectation based on pressure.
- It is thought that this is due to the ships' reports being too few in number to be representative of the average conditions. Until more ships' observations become available there must therefore be some uncertainty about the predominant winds in the south central area (south of about Lat. 43° N. and between Longs. 30° and 40° E.).
- In the winter months, as typified by January, the predominant winds in the west (west of Long. 30° E.) and north (north of Lat. 43° N. and between Longs. 30° E. and 36° E.) are from directions between north and north-east. East of Long. 36° E. and north of Lat. 43° N., the predominant winds are easterly or south-easterly in this season. In the extreme east (east of Long. 40° E.) easterlies predominate. In the south central area (as defined above) it is probable that easterlies and westerlies are fairly evenly matched and that winds from these directions are more frequent than northerlies or southerlies. Throughout the whole area the winds in the winter months (October to March) vary considerably from one day to another, largely on account of the passage of depressions.

- Average wind speeds are higher in January and February than at any other time of the year. In general the mean wind speed increases with increasing distance from the coast. The regions of maximum wind speed are, however, nearer the northern coasts than the southern. The highest average wind speed in January is 16 knots. This value has been observed

over a considerable area of open sea centred around Lat.  $44^{\circ}$  N., Long.  $31^{\circ}$  E. A similar value has been observed over a smaller area centred around Lat.  $44^{\circ} 30'$  N., Long.  $36^{\circ} 30'$  E. From these centres of highest mean speed, the values fall off to about 12 knots off the mouths of the Danube, to about 10 knots off the south-east coast of the Crimea, and to about 8 knots in the south-eastern parts of the Black sea off Turkish coast near Giresun. 5

Gales (force 8) reach their highest frequency in winter when, in the west and north-west of the region, their average frequency amounts to about 5 per cent of the wind observations. Most of these gales are from the north-east. Some, however, are from the south or south-east and occur in advance of a depression approaching from the west. These, although short-lived, can be uncomfortable especially towards the western coasts on account of the steep cross seas that occur when strong winds oppose the south-going current in this region (see current diagram on page 47). In the south-east of the region gales are most frequently from directions between north and west. Winds of force 12 have been reported off the western coasts of the Black sea, and near Novorossiysk. 10 15

In summer, over most of the area east of about Long.  $32^{\circ}$  E., the predominant wind direction is westerly or north-westerly. In the north-west, off western Crimea and thence southward and seaward, the predominant direction is north-west or north. In the south-west of the region (south of Lat.  $43^{\circ}$  N. and west of Long.  $32^{\circ}$  E.) the predominant direction is north-easterly. As in winter, the degree of predominance is not great and the winds are fairly evenly distributed round the compass. 20 25

In the west (west of Long.  $32^{\circ}$  E.) in summer, the predominantly northerly winds may be regarded as part of the general monsoon flow which also affects the Aegean and Eastern Mediterranean. These winds are known as "etesian" (Greek) or "meltemi" (Turkish). Farther east this flow is locally diverted into a westerly flow over the central and western Black sea. 30

In all parts of the region, average wind speeds are much lighter in summer than in winter. The average wind speed in July is highest at 10 knots over the open sea in the more northerly parts but falls off southwards and is less than 6 knots over an appreciable area in the south. Gales (force 8) are very rare in the months June, July and August. In the rather limited number of ships' observations available, no gales were reported from more than half the individual ( $2^{\circ}$ ) ocean squares and where reported they did not in any case account for as much as one per cent of the total observations. 35 40

Roughly speaking, the winds described for January may be regarded as an approximation to the conditions for the winter half year (October to March) though with directions becoming more variable and average speeds lower towards the beginning and end of the period. Rapid changes during April and early May with rather variable conditions precede the summer conditions already described, of which the July values are typical. These conditions persist with minor variations till early September. In the latter part of September, sometimes continuing into early October, there is a rapid change back to the winter conditions. 45

**Winds and Gales (within 20 miles of the coast).**—Within about 20 miles of the coast, the winds as described for the open sea become progressively modified in various ways which are set out under the heading *Local modification of the weather near the coast* in N.P. 100 *The Mariners' Handbook*. These local effects including land and sea breezes are all well marked in this region. 50 55

In the Dardanelles and the Bosphorus, north-easterly winds are the most

frequent in all seasons, representing outward drainage of air from the Black sea to the Aegean. When not blowing from this quarter, the winds are mostly south-westerly.

At Istanbul (Kandilli) northerly or north-easterly winds predominate throughout the year. Mean speeds at 1,300 are lowest (11 knots) in May and are highest (16 knots) in August. Gales (force 8) occur on 3 to 4 days per month, on the average, from December to February, and on less than one day per month from May to September.

At Odessa winds are variable in winter. In summer (June to September), however, the winds are mainly between west and north in the early morning and become mainly south-easterly or southerly by early afternoon. Mean monthly wind speeds in winter are all between 10 and 13 knots both at 0700 and 1300 local time but the values are lower (8 to 9 knots) at 0700 in summer. Gales (force 8) are most frequent (2 days per month on the average) in November and least so from July to September (about 0.2 days per month).

At Batumi in winter the wind is predominantly easterly in the early morning but northerly in the afternoon. In summer it is northerly in the early morning and westerly in the afternoon. Mean monthly wind speeds are all within the range 5-8 knots both at 0700 and 1300. Gales (in this case 29 knots or more) have an average frequency of 2 days per month from December to May and are least frequent (less than half a day) in July.

Similar data regarding wind direction, average speed and gale frequency are given for a large number of ports in the climatic tables at the end of this chapter.

Near the coast, especially in summer, the afternoon winds are usually onshore whereas in winter the early morning winds are predominantly offshore. For example, at Feodosiya, the early morning winds are predominantly north-westerly, whereas the afternoon winds in summer are predominantly southerly. Similarly, at Sochi, early morning north-easterlies give place on summer afternoons to westerlies.

Local effects such as the position of mountain barriers and the orientation of valleys play an important part in determining wind direction. The Rionskiy valley, which extends eastwards from near Poti, has an important effect in directing the winds in its vicinity. In winter the winds blow through the valley from the east, and in summer from the west. The effects of the eastward and westward flow through this valley are felt at a considerable distance out to sea.

At Novorossiysk a strong cold north-easterly wind known as the "bora" (or "bura") sometimes blows with extreme violence. The local topography causes the wind to blow much more strongly here than elsewhere along this coast. The bora is favoured by high pressure over the land to the north, and low pressure over the sea. In the bora, the extremely cold air plunges through the pass in the hills above Novorossiysk like an avalanche. Wind speeds of 78 knots are often observed and on rare occasions as much as 116 knots. On such occasions the air in the harbour is filled with sea spray and on account of the freezing temperature all exposed parts of the ship become coated with a growing thickness of ice. Small vessels have foundered under these conditions. On land, apart from the extreme discomfort of a freezing gale, it is said to be dangerous to venture into the streets for fear of injury by stones, roof-ice, etc., driven by the wind. Cars have been overturned. On the average, during the winter months, the bora lasts for about 3 days, but is sometimes more prolonged. See also page 63.

Further details concerning local winds at a number of coastal localities

are included in the body of this volume under the appropriate geographical heading.

Wherever the coasts are mountainous, local squalls are liable to be experienced on occasions of strong offshore winds or during thunderstorms.

**Cloud.**—In general, the winter months are moderately cloudy and the summer months, for the most part, are fine.

At sea the average cloud amount is greatest, 5–6 oktas (eighths), in winter (December to February) and least, 2–3 oktas, in summer (June to August). There is little diurnal variation at sea.

At coastal stations in the west and north there is a big contrast between the rather cloudy conditions in winter, when most stations average 6–7 oktas, and the mainly fine summer conditions with monthly averages of 2–3 oktas. In winter there is little variation in average cloud amount according to time of day. Even in mid-summer the difference between the average cloud amounts at 0700 and 1300 is seldom as much as one okta.

For most stations in the west and north, the most cloudy month is December and the least cloudy is August. In the extreme east, at Batumi, February is the most cloudy month and September or October is the least cloudy. Along the north Turkish coast the most cloudy month is January or February and the least cloudy varies between June and August. On the eastern coasts, from about Sukhumi to Giresun, the summers are appreciably more cloudy than in the west and north. Average summer cloud amounts are about 4–5 oktas on the east coasts compared with 2–3 oktas in the west and north. From about Giresun, the summer cloud amounts decrease eastward along the coast of Anadolu towards the region of the Sea of Marmara where the smallest amounts (about 2 oktas) are observed. Details of the monthly average cloud amounts both in early morning and in early afternoon at a number of stations are given in the climatic tables at the end of the chapter.

In winter there are frequently large amounts of stratified cloud, and sometimes thick layers of stratocumulus. Ships report cloudy skies (meaning more than 6 oktas) in more than 50 per cent of occasions. In summer the cloud type is largely cumulus and at this season more than 50 per cent of ships observations indicate clear skies (less than 2 oktas). Naturally the cloud conditions are closely linked with the synoptic situation. The approach of a depression commonly involves increasing, thickening, and lowering clouds, which later lift, break and gradually disperse as the depression moves away and is replaced by a ridge of higher pressure. However, in the case where the depression is one of a family of depressions, there may be only a small improvement in the skies before the clouds thicken and lower with the approach of the next depression.

**Rain, Snow, Thunderstorms.**—The average annual amount of rainfall (including the water equivalent of snow) varies considerably from one part of the region to another. In general the amounts are small (mainly 300 to 500 mm. or 12–20 in.) in the north-west and north but are considerable (2,000 to 3,000 mm. or 79–118 in.) in the extreme east, around Batumi.

Near Istanbul the mean annual rainfall is in the range 750 to 1,000 mm. (30–39 in.). This decreases northward along the coast of Bulgaria and falls to 300 to 400 mm. (12–16 in.) along the Rumanian coast.

Along the Russian coasts, west of Kerchenskiy proliiv amounts are mainly in the range 300–500 mm. (12–20 in.). Eastward from the strait, the mean annual rainfall increases progressively. From Sochi to Poti amounts are between 1,000 and 2,000 mm. (39–79 in.). After the maximum around Batumi, amounts fall off westward along the Turkish coast, most of which has amounts of 1,000–2,000 mm. (39–79 in.) but there

is a drier region (with 500–750 mm. or 20–30 in.) from about Samsun to Sinop.

The seasonal variation of rainfall is similarly variable. In the Dardanelles and the southern Sea of Marmara, by far the most of the rain falls in the winter and the summer is very dry. At Istanbul and on most of the Turkish Black sea coast, winter is the wet season and summer the dry, but there is less discrepancy between winter and summer rainfall. In the wet region around Batumi May is the driest month with about 84 mm. or 3·3 in. and September is the wettest with about 312 mm. or 12·3 in. On the northern and western coasts, from about Novorossiysk to Varna, the seasonal variation is not well marked and varies from place to place. In some places, for example Yevpatoriya, the rainfall in the wettest month is only half as much again as in the driest month.

At several stations in the north the seasonal variation is in marked contrast with that in the south-west of the region. For example, at Kerch' and Odessa the wettest month occurs in summer (June) and the driest month is March.

Further details of the average monthly rainfall amounts at a number of coast stations are given in the climatic tables.

The number of days with rain (1 mm. or 0·04 in. or more) varies from about 60 per annum in the north-west to 140 per annum at Batumi.

There is considerable variability in the monthly rainfall figures from one year to another. In most months of the year stations in the north have at some time or other recorded nil as their minimum rainfall.

During winter and early spring some of the precipitation falls as snow. Over most of the region snow is rare before November and after April. At Çanakkale in the south-west the average number per month, of days with snow is 2 in December. Such days are most frequent (3) in January and decrease to 2 in March and to less than one in April. None is reported from May to October. The more land-locked ports in the north have more snow spread over a longer period. To quote an extreme case, at Rostov-na-Donu, days with snow are rare in October, but increase to 3 per month in November and reach a maximum of 10 in January before declining to one in April. Only the months May to August are entirely free. Here, from December to March, snow is more common than rain.

The duration of snow cover on the ground varies considerably between the various parts of the region. On the Turkish Black sea coasts the number of days with snow lying is estimated to be between 5 and 15. The number of such days increases northwards, and over much of the northern coasts is about 20–30 days. At Rostov the average number is 68 and in individual years has varied between 19 and 116.

Thunderstorms are infrequent at sea. On the coast they are least frequent in the south of the Crimea and along the south coasts of the Black sea. They are most frequent on the north-east coasts of the Sea of Azov and in the north-east of the Black sea where the Caucasus are nearest to the coast.

The mean number of days per annum with thunder heard is as much as 38 at Sukhumi and 34 at Sochi, but at Sevastopol, the number is only 7. Although they may occur in any season, thunderstorms are, in general, much more frequent in summer than in winter.

**Fog and Visibility.**—Ships' data regarding fog over the sea are too scanty to provide detailed information. They would seem to show that fog at sea is most frequent (about 2–5 per cent of the observations) in spring (March to May) and least so (nil) in August and September.

Data concerning the frequency of fog at coastal stations are plentiful and give an accurate picture of the seasonal variation. Monthly fog

frequencies for a number of coastal stations are given in the climatic tables. Unfortunately, in some cases, the criterion for fog is not stated. In most of these cases it is thought to be the generally accepted one of visibility less than 1,100 yards (1 km.), but in some cases the unexpected high frequencies are considered to be due to the use of a different criterion involving a greater visibility. Accordingly, there must be some reservation about comparing frequencies at one station with those at another. 5

*The Dardanelles, Sea of Marmara, and the Bosphorus.*—In general there is comparatively little fog in the Dardanelles and in the Sea of Marmara. It is most frequent in winter and least so in summer. At Çanakkale the average number, per month, of days with fog is barely one even in the winter months (November to March) and is negligible in summer (June to August). At Bandırma the average is between 1 and 4 in the months September to May, with a maximum in November, and is negligible in June and July. 10 15

In the neighbourhood of Istanbul the fog frequencies vary considerably from one suburb to another and the same applies to the seasonal variation. In general the latter is not great and is not well defined. In most places fog is rare in July and is most frequent in one of the months September to April. 20

In all this region fog is most frequent around dawn and usually disperses during the morning.

*Western shores of the Black sea from Bosphorus to Belgorod-Dnestrovskiy.*—Along most of this coast, fog is most frequent in one of the months October through March and least so in July and August. The average number, per month, of days with fog is between about 3 and 5 in the months with most fog, and falls to a half or less in July and August. 25

At Brăila, on the Danube, the fog frequency is greatest (7 days per month) in December. All the months October to March have frequencies of between 3 and 7 days per month. In the summer half year the frequencies are much less, and become negligible in July. 30

*Northern coasts from Odessa to Kerchenskiy proliv, including the coasts of the Sea of Azov.*—Fog is more frequent on these coasts than in other parts of the Black sea and tends to be more prolonged. The coasts are exposed to moist southerly airstreams which when chilled over the cold plains in the winter months are liable to produce widespread fog, which may be persistent. 35

In general, fog is most frequent from October through March and is least frequent in summer. December with an average of about 5–9 days with fog is the foggiest month at most stations, and June and July (with less than half a day per month) are the least foggy months. 40

Odessa is more prone to fog than are most of the Black sea ports. It has an average of 8 days with fog in December and between 5 and 8 days in all the months October through March. There is considerably less fog in the remaining months and June and July each have less than half a day, on the average. The figures for Rostov-na-Donu are similar. 45

The southern shores of the Crimea are notably less foggy than the other parts of this region. Here, the average number per month of days with fog is about 2–4 in the month of greatest frequency which varies between December and May. July to September is the least foggy period, with monthly averages of less than half a day. 50

In the Sea of Azov and in the Black sea between Crimea and Odessa, “steaming” fog sometimes occurs in autumn and winter when very cold easterly or north-easterly winds blow across the relatively warm 55



water. Such fog may be dense but does not usually extend to many feet above the sea surface.

*Eastern and southern coasts from Novorossiysk to the Bosphorus.*—At most places on these coasts fog is most frequent in spring, the highest frequencies being reported in either May or April. In these months the average number of days with fog is about 3–5, per month, at the majority of stations. Here also there is little fog in summer but in places the season with least fog extends over all the latter half of the year. Thus at Sinop, for example, days with fog are most frequent (6 per month) in May, and are moderately so (3–4) in March and April; the period with least fog (less than half a day per month) extends from July through December. Batumi, however, is an exception, since here there is rather more fog in October (5 days, on the average) than in the spring months which have 4 days per month, on the average.

As well as being less frequent than in the north-west, fog is more short-lived and there is less probability of widespread fog. The high ground that surrounds these coasts protects them from the moister air-streams, and the steeper slopes provide better air drainage. Fog tends to be localised in the bottoms of valleys and to be largely confined to late night and early mornings.

In all parts of the region visibility is liable to be reduced by other factors besides fog. Heavy rain reduces visibility but seldom reduces it below 1,100 yards (1 km.) except for brief periods. Snow is a more serious threat since even a moderate fall is liable to reduce visibility below this limit. Especially dangerous conditions are experienced when snow and strong winds combine to form a “blizzard”, where in the usual dangers of strong winds are aggravated by the loss of visibility. Blizzards are most likely in the more land-locked ports in the north. At Rostov-na-Donu, in February, 35 per cent of the occasions with visibility less than 1,100 yards (1 km.) are due to blizzard.

**Air temperature.**—The average (monthly) air temperature over the sea is highest in July or August and lowest in January or February. In the former months there is little variation from one part to another, values being highest 24° C. in the central parts of the eastern Black sea and lowest 22° C. off the Turkish coast near Zonguldak. In January, however, the air temperature varies considerably from one part to another. The average is now highest, about 8° C. in the open sea in the south-east, and fairly high 7° C. in the open sea in the south-west. From these regions of relatively high temperature the values decrease towards the coasts at this season. Whereas the decrease towards the southern coasts is small, the decrease towards the northern coasts is considerable. Thus temperatures decrease to below 0° C. towards the Kerchenskiy proliv and are below 0° C. over a considerable coastal region in the north-west from about the mouths of the Danube to the north-west coast of the Crimea. After February, the air temperature begins to rise, slowly at first and then more rapidly in April and May. Since the temperatures near the coast rise more rapidly than those in the open sea, the discrepancy between the two decreases, and is largely obliterated by May when the average temperature is about 15–16° C. throughout the region. The temperature thereafter continues to rise until July. August shows little change compared with the July values, given above. In September the temperature begins to fall. The biggest fall occurs between October and November after which the temperature more gradually approaches the minimum values.

Temperatures reported by coastal stations show a similar seasonal trend to that described above for the open sea. Especially at the more

sheltered, inland stations the seasonal range, and still more the range between extremes, is greater than over the sea.

Mean annual temperatures are greatest in the south (14° C. at Çanak-kale and Batumi) and least in the north (9° C. at Rostov and 10° C. at Odessa).

At Istanbul, representing one of the warmer places, the average daily maximum and minimum temperatures in August, the warmest month, are 28° C. and 19° C. respectively. In February, the coldest month, the corresponding values are 8° C. and 2° C. Extremes of 41° C. and -9° C. have been recorded.

At Taganrog, one of the colder ports, July is the warmest month with mean daily maximum and minimum temperatures 29° C. and 18° C. January is the coldest month, with corresponding values -3° C. and -9° C. Extremes of 38° C. and -33° C. have been recorded.

Average values of daily and monthly maximum and minimum temperatures, together with extreme values, for a number of coastal stations are given in the climatic tables. For many of the Russian stations, values of the mean daily maximum temperature are not available, and the average at 1300 is quoted instead.

In general the temperatures along the southern coasts of the Black sea as far as Batumi do not vary very much from those quoted for Istanbul.

Going northwards along the western coasts the winter temperatures get progressively colder and already by Constanța, the January mean has fallen below 0° C. Except in the south of the Crimea the January mean temperatures are below freezing on all these northern coasts from about Constanța to east of Kerch'. For information of ice in this region, see article on "Ice" commencing on page 27.

The southern and particularly the south-eastern coasts of the Crimea are noted for their relatively mild winters. At Yalta even in the coldest month (January) the mean daily minimum temperature remains above freezing.

From Novorossiysk south-eastwards, the average temperatures gradually rise until at Batumi the average temperatures are similar to those at Istanbul. Extremes of high temperature at Batumi, however, are only 35° C. compared with 41° C. at Istanbul. It can be very cold in winter at Novorossiysk where the combination of high wind speed with freezing temperatures experienced in the local bora is extremely unpleasant; see also page 58.

**Relative humidity.**—Monthly mean values of relative humidity in this region are not particularly high. They reach about 90 per cent in the north on winter mornings when at their highest but fall to about 50 per cent in the north on summer afternoons when at their lowest. On the western and northern coasts, from about Burgas as far as Kerchenskiy proliv, including the coasts of the Sea of Azov, the average relative humidity is highest in winter (December or January) and lowest in summer (July or August). Typically, in winter, early morning values of about 90 per cent drop to about 80 per cent in early afternoon. In summer there is a larger discrepancy and the early morning values of about 70–75 per cent fall to 50–60 per cent in the early afternoon. On the eastern and southern coasts from east of Novorossiysk nearly to Istanbul the average humidity values show less seasonal and diurnal variation than those just described for the west and north. At many places the highest values occur in May and the lowest in December. In May, values are typically about 80–85 per cent in the early morning and fall to about 75 per cent in the early afternoon. In December there is even less diurnal variation; early morning values are typically 70–75

per cent and early afternoon values, around 70 per cent. The lower early morning humidities in winter in these parts are thought to be due to the effect of offshore winds in mountainous territory.

Extreme values of humidity are more often experienced in the north-west and north, than elsewhere. These are the regions most prone to fog, corresponding with the relative humidity values of 100 per cent. They are also prone to very low values (20 per cent or below) at times, particularly with easterly winds. These abnormally dry easterlies which occur chiefly in the summer months are known locally as "sukhovei".

- 10 **Sea surface temperature.**—Figs. 4–7 illustrate the distribution of average (monthly) sea surface temperature ( $^{\circ}\text{C}.$ ) in the months February, May, August and November. The lowest sea temperatures are observed in February (locally March) and the highest values in August. In February the average sea surface temperature falls below  $0^{\circ}\text{C}.$  in a coastal
- 15 strip from about the Danube delta around all the north-western shores to the western Crimea. The coastal waters of the Sea of Azov also have temperatures below freezing at this time although the temperatures in the central parts of this sea are as high as  $3^{\circ}\text{C}.$  (For ice conditions *see* article on "Ice",—commencing on page 27). From freezing temperatures in the
- 20 Kerchenskiy proliv there is a rapid rise in temperature southward, and temperatures off south-east Crimea are as high as  $7^{\circ}\text{C}.$  The highest values,  $7^{\circ}\text{C}.$  ( $8^{\circ}\text{C}.$ ) in February are observed in the south-east.

- After February, the sea temperature rises, slowly at first and then more rapidly. By May much of the area has temperatures within a few
- 25 degrees of  $15^{\circ}\text{C}.$  By August the sea temperature is at its highest value and is then over  $25^{\circ}\text{C}.$  in the east and in the more land-locked parts of the Sea of Azov but is somewhat cooler about  $21^{\circ}\text{C}.$  in the north-west and about  $24^{\circ}\text{C}.$  in the south-west, off Istanbul. After August the sea temperature gradually falls. By November the average temperature is
- 30 again within a few degrees of  $15^{\circ}\text{C}.$  over much of the region though in the most northern parts it is about  $10^{\circ}\text{C}.$  After December the temperatures decrease more slowly as they approach the February minimum.

- Ice accumulation.**—In certain weather conditions ice accumulation on the hulls and superstructures of ships can be a serious danger. Ice
- 35 accumulation may occur from three causes:—

- (i) Fog with freezing conditions, including "frost-smoke",
  - (ii) Freezing drizzle or freezing rain, and
  - (iii) Sea spray or sea water breaking over the ship when the air temperature is below the freezing point of sea water (about  $-2^{\circ}\text{C}.$ ).
- 40 The weight of ice which can accumulate from causes (i) and (ii) may increase on the rigging to such an extent that the ice is liable to fall and endanger those on deck. It is, however, small in comparison with the weight of ice accumulating in rough weather with low temperatures, when large amounts of spray, and often heavy seas, break over the vessel.
- 45 When the air temperature is below the freezing point of sea water and the ship is in heavy seas, considerable amounts of water will freeze on to the superstructure and those parts of the hull which are sufficiently above the water-line to escape being washed frequently by the sea. The amount so frozen to surfaces exposed to the air will rapidly increase with
- 50 falling air and sea temperatures and might in extreme cases lead to the capsizing of the vessel.

- The dangerous conditions are those in which strong winds are experienced in combination with air temperatures of about  $-2^{\circ}\text{C}.$  or below. The rapidity with which ice accumulates increases progressively
- 55 as the wind increases above force 6 and as the air temperature falls further below about  $-2^{\circ}\text{C}.$  It also increases with decreasing sea tempera-

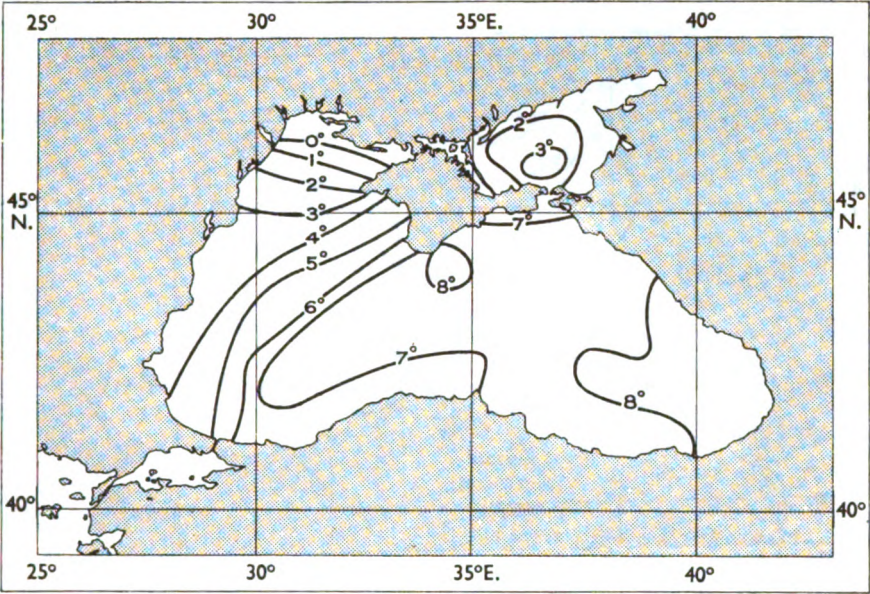


Fig. 4. Sea surface temperatures (°C) — February

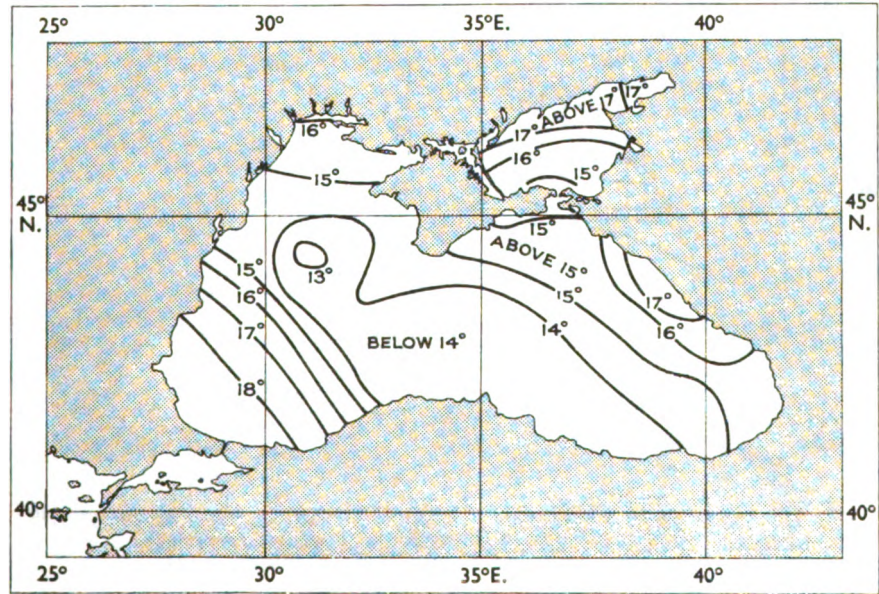


Fig. 5. Sea surface temperatures (°C) — May



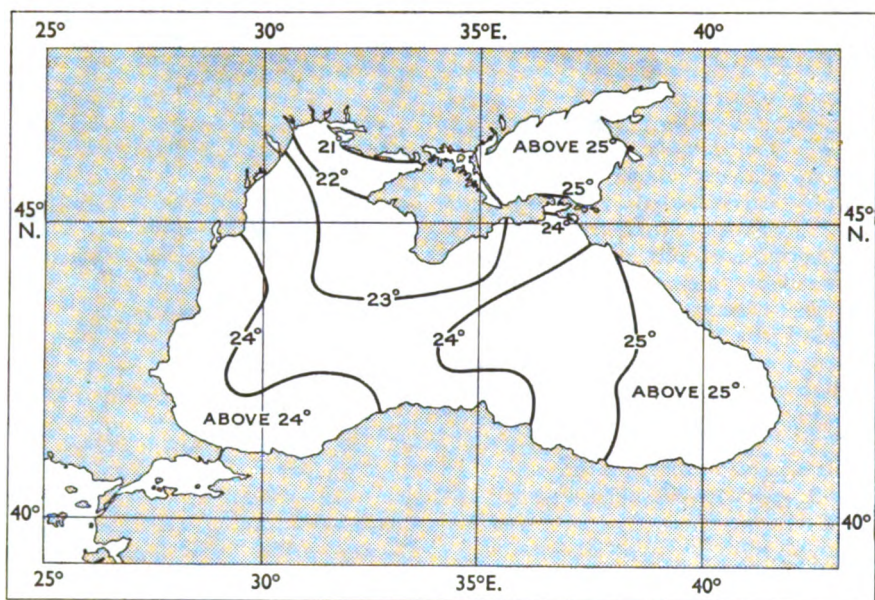


Fig. 6. Sea surface temperatures (°C) — August

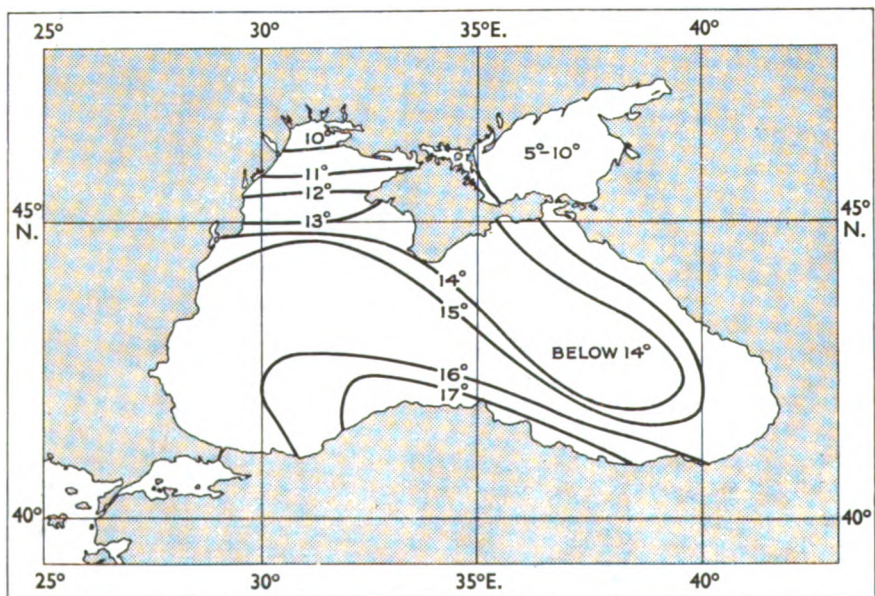


Fig. 7. Sea surface temperatures (°C) — November

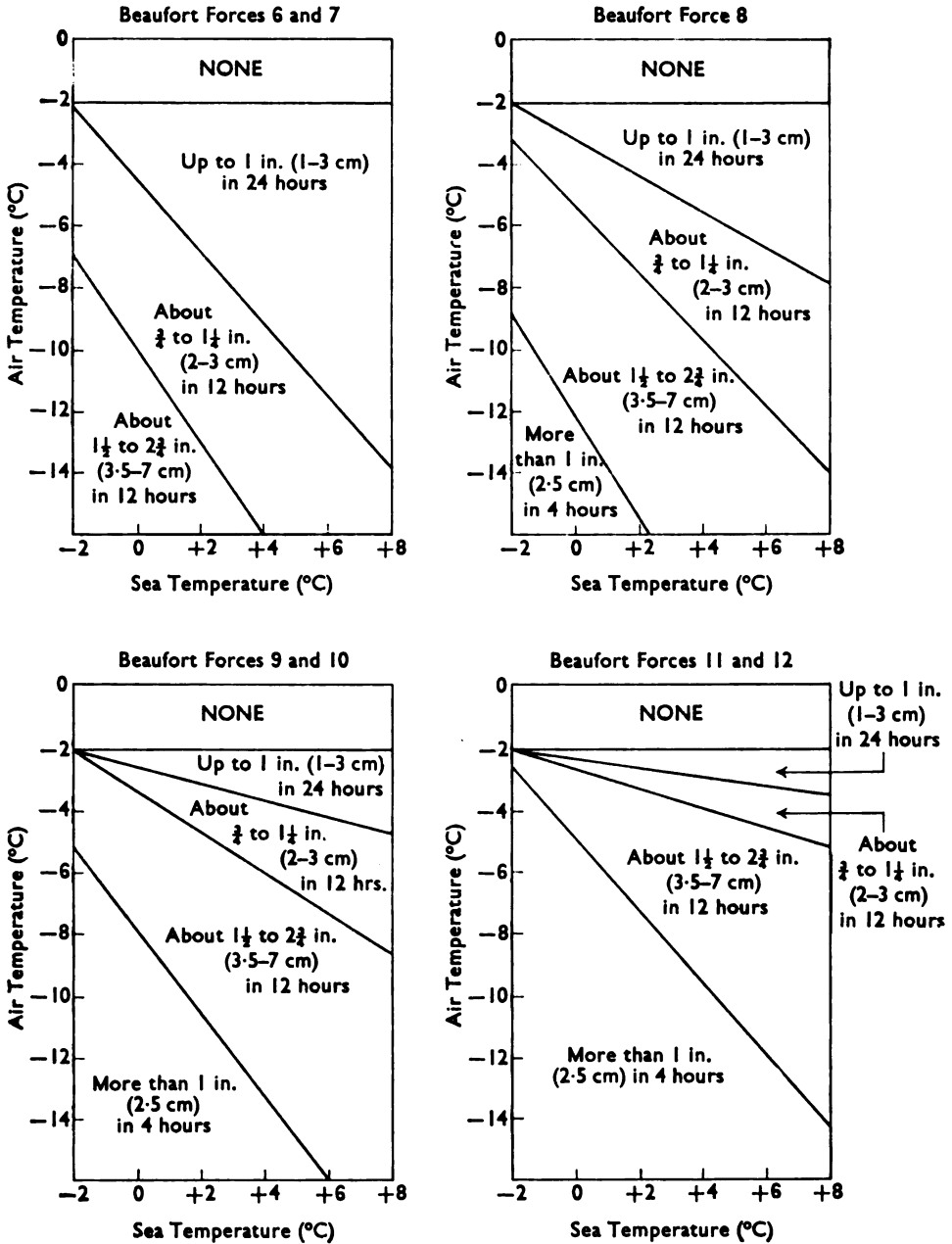


Fig. 8. Diagrams for assessing rate of icing in terms of wind force, air temperature and sea temperature  
(The diagrams apply to slow-moving trawlers)

tures. The rate of accumulation also depends on other factors such as ship's speed and course relative to wind and waves, as these factors affect the amount of spray produced.

Dr. H. O. Mertins of the German "Seewetteramt" has collected some 400 observations of icing due to spray, mostly from the seas around Iceland, Greenland, and Labrador, and from the Barents sea, covering the period of about 1958-1967. From these observations he has produced diagrams which enable the rate of ice accumulation to be estimated from the expected values of wind force, air temperature and sea temperature. These diagrams are reproduced, by kind permission, in the accompanying Fig. 8. The four diagrams indicate separately for winds of Beaufort forces 6 and 7, force 8, forces 9 and 10, and forces 11 and 12, the different rates of ice accumulation which may be expected on a slow moving trawler, with various air and sea temperatures.

It will be appreciated that it is very difficult to forecast accurately the three variables involved. Accordingly the mariner is advised to exercise all possible caution whenever gales are expected in combination with temperatures of  $-2^{\circ}$  C. or below. These conditions are most likely to occur with winds between east and west, through north, but the direction may be any that will transport sufficiently cold air. If the said conditions are expected, the prudent course is to steer towards warmer water, or to seek shelter, as soon as possible.

The risk of ice accumulation is largely confined to the northern coasts from November through March. The greatest risk is with bora type gales (*see under "Winds and Gales within 20 miles from the coast" on page 57*) especially in the vicinity of Novorossiysk. Here, in the bora, winds of up to force 12 are observed and temperatures on occasion have been as low as  $-20^{\circ}$  C. Near this port the strongest winds blow from directions between north and east and thus blow off the land. The wind strength falls off rather rapidly towards the open sea. Thus, near the coast, where the wind is strongest, the fetch is small and limits the size of the waves; *see also page 63*.

**CLIMATIC TABLES.**—The tables that follow give statistics for several land stations where weather reports are made regularly. The figures given are averages, percentage frequencies, or extremes as stated. It must be realised that *these values refer to the actual positions in which the weather has been observed*, and not necessarily to the open sea or to the approaches to ports in the vicinity. The tables for land stations should therefore be consulted with discretion since all the elements are affected, some of them considerably, by local conditions. The following notes indicate ways in which conditions over the open sea may be different from those at the nearest reporting station for which a table is published.

- (i) Wind speed is nearly always greater over the sea than over the land, and there may be twice as many gales at sea as are experienced at a shore station, unless it is exceptionally well exposed, as for example, on a headland or small low-lying island. Wind direction is affected as explained under "Local Modification of weather near the coast" in N.P. 100 *The Mariners' Handbook*.
- (ii) Cloud amount at the reporting station may differ considerably from that a few miles out to sea.
- (iii) The figures for precipitation are generally fairly applicable to coastal waters but become less applicable with increasing distance from the coast. Where there are high cliffs, or where a range of hills rises closely behind the reporting station, then with onshore winds, the station may report considerably more precipitation than would be experienced a few miles out to sea.

- (iv) The figures for fog or poor visibility at land stations are liable to be most misleading as a guide to conditions at sea and in the approaches to ports. Fog over the open sea is largely of the type associated with mild winds blowing over relatively cold water and is most common in summer. Fog inland, however, and near the heads of inlets is frequently of the radiation or "frost smoke" types which occur most often in winter. When it is foggy in a sheltered harbour or inlet it is often clear at sea, and vice versa. 5
- (v) Temperatures over the sea are less variable than over the land. In winter, the temperature is usually higher over the sea, especially during the night. In summer it is usually cooler than over the land, especially during the day. 10

Temperatures, in the tables, are quoted in degrees Celsius. For conversion to degrees Fahrenheit, and vice versa, *see* Temperature Conversion Tables below. 15

Rainfall, in the tables, is quoted in millimetres. For conversion to inches, *see* diagram on page 70.

The places for which climatic tables are given are:—

Çanakkale.	
Istanbul (Kandilli).	20
Varna, Bulgaria.	
Constanța, Rumania.	
Brăila, Rumania.	
Odessa.	
Nikolayev.	25
Sevastopol'.	
Kerch'.	
Taganrog.	
Novorossiysk.	
Batumi.	30
Samsun.	
Zonguldak.	

## TEMPERATURE CONVERSION TABLES

### 1. Celsius to Fahrenheit

°C.	°Celsius									
	0	1	2	3	4	5	6	7	8	9
	Degrees Fahrenheit									
-20	-4.0	-5.8	-7.6	-9.4	-11.2	-13.0	-14.8	-16.6	-18.4	-20.2
-10	+14.0	+12.2	+10.4	+8.6	+6.8	+5.0	+3.2	+1.4	-0.4	-2.2
-0	32	30.2	28.4	26.6	24.8	23.0	21.2	19.4	+17.6	+15.8
+0	32	33.8	35.6	37.4	39.2	41.0	42.8	44.6	46.4	48.2
+10	50.0	51.8	53.6	55.4	57.2	59.0	60.8	62.6	64.4	66.2
20	68.0	69.8	71.6	73.4	75.2	77.0	78.8	80.6	82.4	84.2
30	86.0	87.8	89.6	91.4	93.2	95.0	96.8	98.6	100.4	102.2
40	104.0	105.8	107.6	109.4	111.2	113.0	114.8	116.6	118.4	120.2
50	122.0	123.8	125.6	127.4	129.2	131.0	132.8	134.6	136.4	138.2

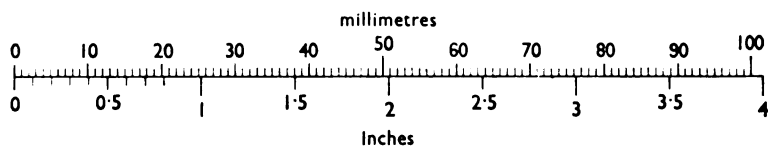


## 2. Fahrenheit to Celsius

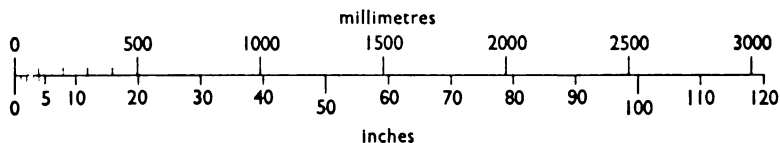
°F.	0	1	2	3	°Fahrenheit		6	7	8	9
	Degrees Celsius									
0	-17.8	-17.2	-16.7	-16.1	-15.6	-15.0	-14.4	-13.9	-13.3	-12.8
10	-12.2	-11.7	-11.1	-10.6	-10.0	-9.4	-8.9	-8.3	-7.8	-7.2
20	-6.7	-6.1	-5.6	-5.0	-4.4	-3.9	-3.3	-2.8	-2.2	-1.7
30	-1.1	-0.6	0	+0.6	+1.1	+1.7	+2.2	+2.8	+3.3	+3.9
40	+4.4	+5.0	+5.6	6.1	6.7	7.2	7.8	8.3	8.9	9.4
50	10.0	10.6	11.1	11.7	12.2	12.8	13.3	13.9	14.4	15.0
60	15.6	16.1	16.7	17.2	17.8	18.3	18.9	19.4	20.0	20.6
70	21.1	21.7	22.2	22.8	23.3	23.9	24.4	25.0	25.6	26.1
80	26.7	27.2	27.8	28.3	28.9	29.4	30.0	30.6	31.1	31.7
90	32.2	32.8	33.3	33.9	34.4	35.0	35.6	36.1	36.7	37.2
100	37.8	38.3	38.9	39.4	40.0	40.6	41.1	41.7	42.2	42.8
110	43.3	43.9	44.4	45.0	45.6	46.1	46.7	47.2	47.8	48.3
120	48.9	49.4	50.0	50.6	51.1	51.7	52.2	52.8	53.3	53.9

## CONVERSION SCALE MILLIMETRES TO INCHES

(1) (for small values)



(2) (for large values)





PLACE—İSTANBUL (KANDILLI). LAT. 41° 4' N., LONG. 29° 4' E. Height above Mean Sea Level, 114m (374 feet).

Climatic Table compiled from 15 to 17 Years' Observations, 1929 to 1965.

Month	# Pressure at M.S.L.	Air temperature			Relative humidity	Mean cloud amount	Rain	Wind direction																		No. of days with wind speed 34 kts. or more	# No. of days with visibility less than 1100 yds.
		Mean daily	Mean min.	Mean highest in each month				Mean lowest in each month	Percentage of observations from 0700						Percentage of observations from 1300						Mean wind speed						
					N.	N.E.	E.		S.E.	S.	S.W.	W.	N.W.	Calm	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	0700	1300		
																				No. of days with		# No. of days with					
																		speed 34 kts. or more		visibility less than 1100 yds.							

January	1018	8	3	16	-3	83	19	25	13	7	13	16	8	1	5	12	28	9	3	8	17	14	1	10	10	11	13	3	1
February	1017	8	3	16	-3	83	16	22	16	5	8	18	12	2	3	12	31	10	2	4	15	22	1	10	11	13	4	1	
March	1017	11	3	21	-2	81	15	18	22	4	7	17	13	2	3	11	28	18	2	2	10	25	5	7	8	11	13	4	1
April	1015	16	7	26	2	81	10	22	21	4	4	10	11	1	2	18	39	11	1	2	8	27	6	4	4	11	13	2	1
May	1014	21	11	29	7	82	9	20	25	5	4	10	11	2	2	21	39	15	1	2	7	24	2	2	6	4	12	1	1
June	1013	25	16	32	12	79	6	23	27	5	4	9	11	2	2	25	50	14	1	1	3	20	2	2	6	7	11	+	+
July	1012	28	18	34	15	79	4	29	33	4	4	2	1	1	4	22	54	19	1	0	3	9	1	11	2	7	15	1	+
August	1013	28	19	34	15	79	38	25	34	8	3	2	2	2	3	21	51	24	2	1	2	8	1	9	2	7	16	1	1
September	1016	24	16	31	11	81	7	24	31	12	7	4	2	1	2	17	53	20	1	1	3	12	1	8	7	15	1	1	
October	1018	20	13	27	7	83	11	23	23	9	10	10	5	1	3	16	33	15	3	2	12	20	2	6	9	12	1	1	
November	1019	15	9	23	2	83	15	19	18	10	13	12	8	1	6	13	25	16	3	5	13	17	3	6	9	12	2	1	
December	1018	11	5	18	1	82	17	21	18	9	12	15	7	1	4	13	26	15	4	5	17	14	4	6	9	11	13	3	1
Means	1016	18	10	35*	-5**	81	—	23	23	7	8	10	7	1	4	17	38	16	2	3	9	18	2	7	5	9	13	19	10
Totals	—	—	—	—	—	—	834	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme Values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	32	28						25						37						15						37			

\* Mean of highest each year.

\*\* Mean of lowest each year.

† Highest recorded temperature.

†† Lowest recorded temperature.

# Observations made at Goztepe (40° 58' N., 29° 05' E., 40m).

Standard of time:—30° E.

+ Indicates less than 0.5.

**Authorities:**—Ankara, Dev. Met. Is. Gen. Mud., Mean & Extreme Met. Bulletin.  
 Istanbul, Kandilli Rasathanesi, Met. Ras. Bull. Met.  
 Istanbul, Kandilli Rasathanesi, İklimi, Sicaklik, 1949.  
 Washington, E.S.S.A. World Weather Records.

*Meteorological Office.*

PLACE—VARNA, BULGARIA. LAT. 43° 12' N., LONG. 27° 55' E. Height above Mean Sea Level, 35m1 (115 feet).

Climatic Table compiled from 7 to 32 Years' Observations, 1896 to 1950.

Climatic Table compiled from 7 to 32 years' observations																				Standard of time:—30° E.														
Month	Pre- sure at M.S.L.	Air temperature				Relative humidity	Mean cloud amount	Rain		Wind direction										Mean wind speed	No. of days with speed 39 kts. or more	No. of days with visibility less than 1100 yds.												
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month			0700	1400	Average fall	No. of days with 1.0 mm. or more	Percentage of observations from					Percentage of observations from																	
												0700					1400						Percentage of observations from					Percentage of observations from						
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\*Highest recorded temperature.  
††Lowest recorded temperature.

Standard of time:—30° E.  
+ Indicates less than 0.5.

\*Mean of highest each year.  
\*\*Mean of lowest each year.

Authorities:—Annuaire de L'Institut Météorologique de Bulgarie.  
Sofia, Khidromet, Sluzba, Trudove Tom IV.

Meteorological Office.

PLACE—CONSTANȚA, RUMANIA. LAT. 44° 11' N., LONG. 28° 40' E. Height above Mean Sea Level, 32m0 (105 feet).  
Climatic Table compiled from 8 to 60 Years' Observations, 1896 to 1955.

Month	Pres- sure at M.S.L.	Air temperature			Relative humidity	Mean cloud amount	Rain	Wind direction																Mean wind speed	No. of days with wind speed 31 kts. or more	No. of days with Fog, not defined																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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\*Mean of highest each year.  
\*\*Mean of lowest each year.

†Highest recorded temperature.  
††Lowest recorded temperature.

Standard of time:—30° E.  
+ Indicates less than 0.5.

Authorities:—Bucharest, Inst. Met., Clima. Rep. Pop. Romine. Vol. II.  
M.O.706, Weather in the Black Sea.

Meteorological Office.

PLACE—BRAILA. LAT. 45° 17' N., LONG. 27° 59' E. Height above Mean Sea Level, 15m0 (49 feet).

Climatic Table compiled from 15 to 60 Years' Observations, 1896 to 1955.

Month	Pres- sure at M.S.L.	Air temperature				Relative humidity %	Mean cloud amount	Rain		Wind direction															Mean wind speed	No. of days with speed 34 km. or more	No. of days with fog, not defined																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Mean daily max.	Mean daily min.	Mean highest in each month	Mean lowest in each month			Average fall	No. of days with 0.1 mm. or more	Percentage of observations from								Percentage of observations from																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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January	mb. 1021	°C. 1	°C. -5	°C. 9	°C. -15	% 82	% 6	OKTAS 30	mm. 30	8	21	18	1	6	15	20	3	8	8	8	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

\*Mean of highest each year.

\*\*Mean of lowest each year.

†Observations at 0700, 1300 and 2000 daily.

†Highest recorded temperature.

††Lowest recorded temperature.

Standard of time:—30° E.

+ Indicates less than 0.5.

Authorities :—Bucharest, Inst. Met. Cent. al Rom., Date Climatologies.  
Bucharest, Inst. Met., Clima. Rep. Pop. Romine, Vol. II.

Meteorological Office.

PLACE—ODESSA. LAT. 46° 29' N., LONG. 30° 44' E. Height above Mean Sea Level, 64m9 (213 feet).  
Climatic Table compiled from 9 to 60 Years' Observations, 1841 to 1960.

Month	Pre- sure at M.S.L. Mean	Air temperature				Relative humidity		Mean Cloud Amount		Rain		Wind direction														No. of days with wind speed 34 kts. or more	No. of days with Fog, not defined		
		#Mean daily 1300	Mean min.	#Mean highest in each month in °C.	#Mean lowest in each month in °C.	0700	1300	Average fall	No. of days with 1 mm. or more	Percentage of observations from							Percentage of observations from												
										N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	N.	N.E.	E.	S.E.	S.	S.W.	W.			N.W.	Calm
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\*Mean of highest each year.

\*\*Mean of lowest each year.

†Mean at 1300, maximum temperature not available.

††Highest recorded temperature.

‡Lowest recorded temperature.

+ Indicates less than 0.5.

Standard of time: —30° E.

#Observations at 0700, 1300, 2100.

Authorities :—Annales de l'obs. Physique Central, St. Petersburg.  
WMO/OMM T.P.52, Climat Normals.

Meteorological Office.

PLACE—NIKOLAYEV. LAT. 46° 58' N., LONG. 31° 58' E. Height above Mean Sea Level, 19m5 (64 feet).  
Climatic Table compiled from 10 to 89 Years' Observations, 1824 to 1929.

Month	Mean at M.S.L.	Air temperature				Relative humidity	Mean Cloud Amount		Rain  No. of days with 1 mm. or more	Wind direction†												No. of days with speed 29 kts. or more	No. of days with fog						
		#Mean daily 1300	Mean daily min.	#Mean highest in each month	Mean lowest in each month		Percentage of observations from			Percentage of observations from																			
							N.	N.E.		E.	S.E.	S.	S.W.	W.	N.W.	Calm	N.	N.E.	E.	S.E.	S.			S.W.	W.	N.W.	Calm	Mean wind speed	
																												0700	1300
January	mb. 1021	-2	-4	-7	-14	88	6	20	7	13	17	8	7	9	9	5	10	22										8	11
February	1019	0	-4	-7	-14	88	6	18	5	5	12	8	8	11	8	5	9	19										8	12
March	1017	5	-1	15	-9	89	6	25	6	6	11	7	9	15	8	4	9	18										9	13
April	1015	13	4	22	-2	82	5	25	6	6	17	6	8	18	0	3	8	19										7	14
May	1013	22	11	28	5	79	5	38	7	8	14	5	7	16	11	3	8	25										7	11
June	1013	25	16	32	11	76	5	58	8	12	11	5	5	14	10	5	13	25										7	11
July	1012	29	17	35	13	74	4	46	7	14	11	3	3	10	11	6	15	27										6	10
August	1013	28	16	34	12	75	4	31	5	15	14	4	5	9	7	5	13	29										6	11
September	1017	22	11	30	4	84	3	28	4	11	15	4	5	11	7	3	12	28										8	12
October	1020	15	6	23	-2	89	6	33	5	9	18	8	8	13	8	3	9	27										8	12
November	1020	6	0	14	-8	90	6	28	6	10	14	8	8	11	10	6	10	23										9	11
December	1020	0	-4	9	-14	84	9	28	6	11	18	8	8	11	10	6	8	20										9	11
Means	1017	13	6	36*	-21**	84	4	5	72	11	16	7	7	12	9	5	10	23										8	12
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—									—	—
Extreme Values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—									—	—
No. of years' observations	49-50	29	18	43	44	12	12	60-64	10-14	44	—	—	—	—	—	—	—	—	—									12	39

Standard of time:—30° E.  
+ Indicates less than 0.5.  
!No. of days with fog not defined.

†Highest recorded temperature.  
††Lowest recorded temperature.  
‡Observations at 0700, 1300, 2100.

\*Mean of highest each year.  
\*\*Mean of lowest each year.  
†Mean at 1300, maximum temperature not available.

Meteorological Office.

Authorities :—Annales de l'obs. Physique Central, St. Petersburg.



PLACE—SEVASTOPOL'. LAT. 44° 37' N., LONG. 33° 31' E. Height above Mean Sea Level, 23m2 (76 feet).  
Climatic Table compiled from 7 to 52 Years' Observations, 1870 to 1937.

Month	Pres- sure at M.S.L.	Air temperature				Relative humidity		Mean Cloud Amount		Rain		Wind direction												Mean wind speed	No. of days with wind speed 29 km. or more	No. of days with wind speed 29 km. or more																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
		Mean daily 1300		Mean lowest in each month		0700		1300		Average fall	No. of days with 1 mm. or more	Percentage of observations from						Percentage of observations from																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		#	°C.	#	°C.	#	°C.	#	°C.			N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	N.	N.E.	E.				S.E.	S.	S.W.	W.	N.W.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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\*Mean of highest each year.

\*\*Mean of lowest each year.

†Mean at 1300, maximum temperature not available.

††Highest recorded temperature.

‡Lowest recorded temperature.

Standard of time:—30° E.

+ Indicates less than 0.5.

§ Observations at 0700, 1300, 2100 daily.

*Authorities*:—Annales de l'obs. Physique Central, St. Petersburg.  
M.O.706, Weather in the Black Sea.

*Meteorological Office.*

PLACE—KERCH'. LAT. 45° 21' N., LONG. 36° 29' E. Height above Mean Sea Level, 3m7 (12 feet).

Climatic Table compiled from 6 to 45 Years' Observations, 1874 to 1934.

Month	Pressure at M.S.L.	Air temperature				Relative humidity		Mean Cloud Amount		Rain No. of days with 1 mm. or more fall	Wind direction												Mean wind speed		No. of days with wind speed 34 km. or more	No. of days with fog					
		Mean daily 1300	Mean daily min.	Mean highest in each month	Mean lowest in each month	Mean of day	0700						1300						Calm	0700	1300										
							Percentage of observations from						Percentage of observations from																		
							N.	N.E.	E.		S.E.	S.	S.W.	W.	N.W.	Calm	N.	N.E.				E.	S.E.	S.			S.W.	W.	N.W.		
							Knots	12	13		14	15	16	17	18	19	20	21				22	23	24			25	26	27	28	29
January	mb. 1020	0	2	0	0	—	—	—	—	—	13	27	14	4	6	3	8	17	8	14	25	13	5	5	7	8	17	6	12	3	4
February	1019	2	—	—	—	—	—	—	—	—	6	26	15	4	9	6	8	15	7	15	26	15	5	5	7	15	17	13	13	2	5
March	1016	5	—	—	—	—	—	—	—	—	11	18	10	6	12	11	11	15	15	11	19	11	10	16	10	9	11	10	15	3	5
April	1015	11	1	13	—6	83	5	—	—	—	7	14	10	6	12	11	11	16	15	11	16	9	17	33	10	5	12	10	15	2	2
May	1015	18	6	18	—7	75	5	—	—	—	5	7	13	8	16	9	7	17	15	11	20	6	12	28	10	5	14	1	10	14	1
June	1012	23	17	28	13	73	4	—	—	—	6	9	4	2	10	12	16	18	13	13	4	12	28	10	5	14	1	10	14	1	1
July	1011	26	19	31	16	68	3	—	—	—	6	12	7	2	6	8	16	25	12	21	20	5	12	16	5	3	17	1	10	14	1
August	1013	26	18	31	16	70	3	—	—	—	6	9	15	9	7	8	18	24	13	19	24	6	12	13	5	5	16	1	9	15	2
September	1017	20	13	27	8	74	3	—	—	—	5	11	15	12	7	3	20	25	9	16	26	13	12	13	9	4	12	1	11	16	3
October	1020	14	9	22	2	80	5	—	—	—	8	14	12	7	9	12	19	12	10	17	13	13	16	6	5	14	3	10	14	4	5
November	1020	8	3	17	—3	85	7	—	—	—	8	22	12	7	7	6	9	20	9	10	21	16	12	11	8	10	7	14	11	14	3
December	1020	3	1	12	—7	86	7	—	—	—	12	24	12	3	4	9	18	9	10	24	13	5	8	10	19	3	12	15	3	5	5
Means	1016	13	8	31*	—14**	79	5	—	—	—	10	17	11	4	7	8	12	19	12	13	21	10	11	15	7	6	14	3	11	14	—
Totals	—	—	—	—	—	—	—	—	—	—	76	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	29	—
Extreme Values	—	—	—	37†	—26††	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	35-38	8-9	6-7	42-45	42-45	31	23-25	11-13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10

\*Mean of highest each year.

\*\*Mean of lowest each year.

†Mean at 1300, maximum temperature not available.

†Highest recorded temperature.

††Lowest recorded temperature.

Standard of time:—30° E.

+ Indicates less than 0.5.

#Observations at 0700, 1300, 2100 daily.

Authorities :—Annales de l'obs. Physique Central, St. Petersburg.

Meteorological Office.

PLACE—TAGANROG. LAT. 47° 12' N., LONG. 38° 57' E. Height above Mean Sea Level, 34m7 (114 feet).  
Climatic Table compiled from 10 to 51 Years' Observations, 1870 to 1963.

Month	Pres- sure at M.S.L.	Air temperature				Relative humidity	Mean Cloud Amount	Rain		Wind direction																		No. of days with speed 34 kts. or more	No. of days with fog, not defined																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
		Mean daily	Mean min.	Mean highest in each month	Mean lowest in each month			Mean of day	Average fall	No. of days with 1 mm. or more	0700									1300																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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\*Mean of highest each year.  
\*\*Mean of lowest each year.

†Highest recorded temperature.  
††Lowest recorded temperature.

Observations at 0700, 1300, 2100 daily.  
Standard of time:—30° E.

Authorities:—Annales de l'obs. Physique Central, St. Petersburg.  
Leningrad, Gidromet, Handbook of Climate of U.S.S.R. Vol. 13, Part II.

Meteorological Office.

PLACE—NOVOROSSISK. LAT. 44° 44' N., LONG. 37° 49' E. Height above Mean Sea Level, 36m9 (121 feet).  
Climatic Table compiled from 9 to 80 Years' Observations, 1881 to 1963.

Month	Pre- sure at M.S.L.	Air temperature				Relative humidity		Mean cloud amount		Rain		Wind direction																Mean wind speed	No. of days with speed 30 km. or more	No. of days with Fog						
		Mean daily max.	Mean daily min.	Mean highest in each month in °C.	Mean lowest in each month in °C.	0700	1300	Average fall	No. of days with 1.0 mm. or more	Percentage of observations from								Percentage of observations from																		
										N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Cal.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Cal.									
mb.	°C.	°C.	°C.	°C.	%	%	OKTAS	mm.	mm.	11	19	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Cal.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Cal.	0700	1300					
January	1019	28	19	34	14	71	57	3	4	61	6	79	11	12	22	5	13	6	5	8	8	21	9	24	4	23	14	6	5	9	6	12	14	5	1	
February	1018	28	19	34	14	66	53	3	3	41	5	66	9	12	25	6	12	7	4	3	10	8	21	12	24	5	21	12	8	5	12	14	5	2		
March	1017	24	15	30	8	68	54	3	3	53	6	66	9	9	24	9	13	9	4	5	5	22	11	18	5	32	18	5	4	5	12	14	5	3		
April	1015	15	7	23	1	74	65	6	5	48	6	48	8	6	21	16	8	8	6	5	7	22	17	16	5	43	17	5	2	3	10	12	9	3		
May	1015	20	12	27	6	77	67	5	5	41	5	41	7	4	16	7	18	10	5	4	4	29	4	13	4	49	16	6	5	5	6	10	12	3		
June	1013	25	16	30	11	75	66	4	4	53	4	53	7	6	14	4	19	10	5	7	6	33	6	12	5	47	16	6	5	5	6	10	12	3		
July	1011	19	9	35	15	77	70	6	6	86	11	86	11	10	26	4	12	11	6	4	7	20	7	25	8	29	5	21	16	7	4	8	12	13	2	
August	1012	28	19	34	14	71	57	3	4	61	6	79	6	7	27	5	9	6	4	2	3	35	9	20	8	35	15	4	5	7	6	10	12	1		
September	1016	24	15	30	8	68	54	3	3	53	5	61	5	10	30	7	6	4	4	4	7	32	7	19	12	26	4	31	18	4	5	8	9	11	2	
October	1019	18	10	25	-3	75	60	4	4	51	6	48	6	8	25	7	10	4	3	3	8	33	9	20	9	20	6	27	21	5	6	7	9	12	3	
November	1020	13	5	21	-4	77	67	6	5	71	9	51	9	8	31	6	12	4	3	3	9	24	8	25	8	29	6	19	13	6	7	4	12	14	3	
December	1019	9	1	16	-9	77	70	6	6	86	11	86	11	10	26	4	12	11	6	4	7	20	7	25	8	29	5	21	16	7	4	8	12	13	2	
Means	1016	17	9	35°	-15°	74	63	5	5	71	—	71	—	8	24	6	12	7	4	5	7	27	8	21	5	31	16	6	4	6	3	10	12	—	—	
Totals	—	—	—	39†	-24††	—	—	—	—	—	93	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	36	25
Extreme Values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	37-39	80	80	80	80	10	11	19-21	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	9-10	

\*Mean of highest each year.  
\*\*Mean of lowest each year.

†Highest recorded temperature.  
††Lowest recorded temperature.

Standard of time:—30° E.

Authorities:—Annales de l'obs. Physique Central, St. Petersburg.  
Tiflis Observatory, Monthly Bulletin.

Leningrad, Gidromet., Handbook of Climate of U.S.S.R. Vol. 13, Part II.

Meteorological Office.

PLACE—BATUMI. LAT. 41° 39' N., LONG. 41° 38' E. Height above Mean Sea Level, 3m1 (10 feet).  
Climatic Table compiled from 5 to 50 Years' Observations, 1870 to 1937.

Month	Pressure at M.S.L.	Air temperature				Relative humidity		Mean cloud amount		Rain  No. of days with 1 mm. or more	Wind direction																Mean wind speed	No. of days with speed 29 km. or more	No. of days with fog, not defined																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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								°C.	°C.		°C.	°C.	%	%	OKTAS	mm.	14	7	8	14	21	18	4	17	7	2				10	22	6	12	14	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2

\*Mean of highest each year.

\*\*Mean of lowest each year.

†Mean at 1300, maximum temperature not available.

††Highest recorded temperature.

†††Lowest recorded temperature.

Standard of time: -45° E.

+ Indicates less than 0.5.

#Observations at 0700, 1300, 2100 daily.

Authorities :—Tiflis Observatory, Monthly Bulletins.

'Meteorological Office.

PLACE—SAMSUN. LAT. 41° 17' N., LONG. 36° 20' E. Height above Mean Sea Level, 39m9 (131 feet).

Climatic Table compiled from 5 to 37 Years' Observations, 1929 to 1965.

Month	Pressure at M.S.L.— Mean	Air temperature				Relative humidity		Mean cloud amount	Rain		Wind direction																		Mean wind speed	No. of days with wind speed 34 kts. or more	No. of days with visibility 1100 yds. or less		
		Mean daily max.	Mean daily min.	Mean highest in		Mean lowest in			Average fall	No. of days with 0.1 mm. or more	0700									1400													
				°C.	°F.	°C.	°F.				Percentage of observations from									Percentage of observations from													
											N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm					
January	mb.	10	4	19	-2	70	63	13	1	1	1	1	32	32	7	9	16	5	12	1	2	3	3	3	6	25	10	12	5	3	1		
February	1018	11	4	20	-2	72	65	14	1	1	1	1	14	34	9	12	15	15	11	3	2	2	2	2	4	11	4	2	13	6	5		
March	1017	12	7	24	-1	76	69	16	2	2	2	3	26	25	7	15	25	20	23	2	2	1	1	1	1	2	23	9	19	12	3		
April	1015	15	7	28	1	77	71	12	3	3	3	3	13	17	3	11	35	33	39	3	1	1	1	1	1	4	1	2	13	8	2		
May	1016	19	12	29	7	78	74	8	4	4	4	3	11	9	5	7	47	33	34	1	0	1	1	1	1	1	1	2	11	7	2		
June	1014	23	16	29	12	70	71	12	6	6	6	3	23	14	7	7	35	37	39	1	0	1	1	1	1	1	1	1	7	2	2		
July	1012	26	19	30	15	69	69	6	3	3	3	3	28	25	6	8	41	29	25	1	0	0	0	0	0	1	1	27	3	2	2		
August	1013	27	19	30	16	70	68	6	3	3	3	3	20	27	8	8	30	45	25	1	0	0	0	0	1	1	2	22	3	3	5		
September	1017	24	16	29	12	74	67	4	4	4	4	3	27	21	5	6	26	36	28	1	0	0	1	3	5	15	2	26	6	3	0		
October	1019	21	13	29	8	73	68	5	5	5	5	3	21	16	5	2	32	32	27	2	0	1	3	12	8	19	17	4	4	4	0		
November	1019	17	9	27	3	71	65	5	5	5	5	1	27	14	7	3	22	25	19	2	4	5	9	26	15	15	15	15	3	3	1		
December	1019	13	6	21	1	68	61	12	3	3	3	1	24	45	7	3	13	11	8	1	4	4	9	26	8	15	18	4	4	4	1		
Means	1016	18	11	34°	-4°	72	68	5	5	5	5	3	23	26	7	8	27	27	26	1	1	1	4	9	3	19	9	3	5	3	5	12	
Totals	—	—	—	39†	-8†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17	
Extremes Values	—	—	—	39†	-8†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	
No. of years' observations	26	30			37			23			30			5																6			20

\*Mean of highest each year.

\*\*Mean of lowest each year.

†Highest recorded temperature.

‡Lowest recorded temperature.

Standard of time:—30° E.

+ Indicates less than 0.5.

Authorities:—Washington, E.S.A., World Weather Records.

Ankara, Yillik, Met. Bulteni.

Ankara, Aylık, Hava ve Zirast Vaziyeti Bulteni.

Meteorological Office.

PLACE—ZONGULDAK. LAT. 41° 27' N., LONG. 31° 48' E. Height above Mean Sea Level, 136m (446.2 feet).  
Climatic Table compiled from 4 to 35 Years' Observations, 1931 to 1964.

Month	Pre- sure at M.S.L. Mean	Air temperature			Relative humidity	Mean cloud amount		Rain		Wind direction														Mean wind speed	No. of days with speed 34 kts. or more	No. of days with wind visibility 1100 yds. or less				
		Mean daily max.	Mean daily min.	Mean highest in each month		Mean lowest in each month	1400		No. of days with Average fall		Percentage of observations from							Percentage of observations from												
							7000	1400	Average fall	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	N.	N.E.	E.	S.E.	S.				S.W.	W.	N.W.	Calm
0700														1400																
Percentage of observations from														Percentage of observations from																
N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm	0700	1400		
January	mb. 1016	9	3	18	-3	76	17	145	7	2	4	25	25	12	2	7	18	19	6	4	4	4	11	6	10	25	15	5	1	
February	1016	9	3	19	-2	75	16	145	3	3	6	27	26	11	4	6	11	15	10	4	4	4	7	6	23	20	13	6	1	
March	1016	10	4	23	-1	75	14	119	4	2	3	27	30	5	12	8	10	15	10	4	4	5	7	33	31	13	6	1		
April	1016	14	7	26	2	78	11	99	4	2	3	21	21	6	12	3	30	23	5	1	1	3	23	47	7	7	5	1		
May	1014	19	12	29	6	78	10	73	4	3	3	17	19	4	10	0	19	20	2	1	1	1	1	1	28	42	2	3	5	1
June	1013	23	15	29	11	77	7	80	4	3	13	27	16	7	10	5	22	24	3	1	1	0	1	1	50	2	3	6	1	
July	1012	25	17	29	14	75	6	69	2	1	9	42	12	7	3	4	21	39	1	0	1	1	1	5	52	1	3	6	0	
August	1013	25	17	30	14	76	7	86	2	2	7	52	14	2	2	2	12	42	7	1	1	1	1	7	40	1	2	6	0	
September	1016	22	15	27	11	78	8	101	2	2	3	53	24	5	1	2	12	37	9	3	4	1	1	34	7	3	3	7	0	
October	1017	19	12	26	7	77	11	144	3	2	2	30	26	8	3	2	10	33	16	2	1	1	1	14	25	7	4	5	1	
November	1018	15	9	24	3	77	14	148	9	3	2	2	30	28	17	5	10	23	5	4	0	1	1	16	25	17	5	5	1	
December	1018	12	6	20	-1	74	16	139	9	5	4	22	29	11	6	11	19	5	3	4	8	14	9	13	18	11	5	5	1	
Means	1015	17	10	33*	-4**	76	5	5	4	3	6	31	22	8	6	5	16	27	6	2	2	4	3	16	34	7	4	6	6	—
Totals	—	—	—	41†	-8†	—	136	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme Values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	8	29	23	23	23	29	35	29	35	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	17	17	17	35

\*Mean of highest each year.  
\*\*Mean of lowest each year.

†Highest recorded temperature.  
††Lowest recorded temperature.

Standard of time:—30° E.  
+ Indicates less than 0.5.

Authorities:—Ankara, Dev. Met. Is. Gen. Mud., Mean and Extreme Met. Bulletin.  
Ankara, Dev. Met. Is. Gen. Mud., Yillik, Met. Bulteni.  
M.O.706 Weather in the Black Sea.

Meteorological Office.

## CHAPTER II

## THE DARDANELLES

*Chart 2429.*

**THE DARDANELLES.—General Remarks.**—The Dardanelles, known to the Turks as Çanakkale boğazi, leads from the Ægean into Marmara denizi; its north-western shore is formed by the south-eastern side of Gelibolu yarımadası (Gallipoli peninsula) and its south-eastern shore is part of the north-western side of Asiatic Turkey. 5

There is a marked difference in the conformation of the two shores of the strait; its north-western side is, for the greater part, steep-to, but its south-eastern side is fringed, almost throughout its length, by a shallow bank which extends over half a mile offshore in some places. 10

The north-western side is, in general, high; partly from its cliffy character, and partly from its more extensive cultivation, which is chiefly corn, it presents, at times, a uniformly yellow and apparently arid aspect.

The south-eastern side is comparatively flat and, within it, a wide plain, which is watered by numerous springs and is fertile and well cultivated, extends about 30 miles south-eastward to the foot of Kaz dağ (Mount Ida). On this side are several bays and roadsteads, most of which are easy of access and contain good anchorages. It is less steep and more thinly populated than the north-western side, and its aspect, on account of its wooded hills and valleys, affords an agreeable relief to the yellow glare of the opposite coast. 15 20

Discoloured water exists off some of the points, but this is not always a sign of shallow depths.

As a rule, a vessel can find temporary anchorage in any part of the strait except in certain areas where anchorage is prohibited, but the Asiatic side is the better as the depths are not so great and it is not so steep-to. The holding ground is good. 25

In general, a vessel should anchor close inshore out of the current, in order to avoid dragging, especially if it should blow hard from northward.

During strong northerly or north-easterly winds in Marmara denizi, that part of the strait north-eastward of Nara burnu ( $40^{\circ} 12' N.$ ,  $26^{\circ} 24' E.$ ), see page 91, affords far less shelter than its south-western part, since both wind and sea sweep violently through it. Gelibolu limanı is the only anchorage in this part of the strait where a vessel can ride safely during a gale from this quarter. 30 35

**Salvage.**—A well-equipped salvage vessel is stationed in the Narrows of the Dardanelles.

**Currents.**—See page 39-44.

**Wind and weather.**—Winds from north and north-east are the most frequent. From October to March, however, winds from between south-east and west occur rather frequently in some years; they are often strong and squally and may sometimes reach gale force. When strong they are usually accompanied by low cloud and rain, and when light there may be fog. Strong south-west winds in the Ægean sea are often associated with calm weather at the entrance to the Dardanelles. 40 45

In July and August the northerly or north-easterly wind known as the



"meltem" blows with great persistence during the day. In some years it begins in late June, and it may continue during part of September.

**CAUTIONS. — Buoyage.** — The buoys marking shoals in the Dardanelles should not be relied upon with regard to their colour, shape, or position.

**Ferry service.**—Vessels should keep a good lookout for the continuous Ferry service vessels and small craft traffic across the Dardanelles and avoid navigation in foggy or bad weather.

**REGULATIONS.—General regulations.**—General regulations for the passage through the Dardanelles are given on pages 9–13.

**Landing regulations.**—See page 10.

**Quarantine regulations.**—See pages 10–11.

**Navigation rules for Dardanelles.**—Passage of the Dardanelles may be made by day or at night, but day navigation is compulsory for large tankers; for rules, see pages 12 and 13.

**Speed of vessels.**—See page 13.

**Pilotage.**—Pilotage through the Dardanelles is not compulsory, but pilotage between Çanakkale and İstanbul is advisable.

Pilots can be obtained at Çanakkale ( $40^{\circ} 09' N.$ ,  $26^{\circ} 25' E.$ ); see page 12.

Owing to the number of vessels in transit, vessels requiring a pilot should give 24 hours radio notice in advance to Çanakkale or, in the case of vessels west-bound, to Black Sea signal stations. See also Regulations on pages 9–13.

*Charts 1608; 2429, and plan of Entrance to the Dardanelles.*

**25 SOUTH-WESTERN PART OF THE DARDANELLES.—Aspect.**—The western approaches to the Dardanelles are described in Mediterranean Pilot, Volume IV.

The western entrance to the strait lies between Kum burnu ( $40^{\circ} 00' N.$ ,  $26^{\circ} 12' E.$ ) and Mehmetçik burnu, formerly known as Cape Helles, about  $2\frac{1}{2}$  miles north-north-westward.

About 6 miles southward from Kum burnu is Beşike burnu from which cliffs extend northward for about 5 miles to Yenisehir burnu. Yenisehir, a village in ruins close within the cape is not fully seen by vessels approaching from southward until it bears about  $045^{\circ}$ , when Kumkale fort, situated on Kum burnu, a low salient point, will also be seen.

Vessels approaching from south-westward may first identify the entrance to the strait by the white cliffs at Mehmetçik burnu, the northern entrance point, on which stands a lighthouse. The British National War Memorial, about a quarter of a mile east-north-eastward of the lighthouse, is conspicuous; it consists of an obelisk, 70 feet ( $21m3$ ) in height, and stands on the highest point at the southern end of the peninsula. Another very prominent mark on the northern side of the entrance is Alçı tepe, 712 feet ( $217m0$ ) high, about 5 miles north-eastward of Mehmetçik burnu; it first appears as an isolated, conical peak. The ruined village of Seddülbahir stands on the slope of a hill which forms Kale burnu, about 7 cables east-south-eastward of Mehmetçik burnu; here are the ruins of Seddülbahir castle, an old stone fortress, and on the height close northward of it are the ruins of another fortress.

A very conspicuous War Memorial tower, built of grey stone and some 80 feet ( $24m4$ ) high, consisting of four square pillars forming a square, topped by a flat stone roof, stands at an elevation of 306 feet ( $93m3$ ) on the northern side of the strait nearly  $1\frac{1}{2}$  miles east-north-eastward of

Kale burnu, half a cable northward of Hisarlık burnu, the eastern entrance point of Anıt limanı; *see* below. When approaching the Dardanelles from seaward this tower is the most prominent object visible.

**Caution.**—Mariners are cautioned not to anchor or fish in the area indicated on the charts by pecked lines in the approaches to and in the south-western entrance to the Dardanelles. *See* also Caution No. 1 on chart 2429. 5

**Landing.**—Landing is permitted at Seddülbahir; *see* page 10. There is a stone pier situated below the castle, with a depth of 10 feet (3m0) alongside its southern face, but in 1948 it was reported to be in ruins. 10

**Coast.—Dangers.—Lights.**—Yenişehir burnu can easily be identified by a hill about 230 feet (70m1) high, on the summit of which is a large house. About 4 cables north-eastward of the cape and a short distance inland are two prominent tumuli, which are said to be the tombs of Achilles and Patroclus. 15

Close within Yenişehir burnu the ground rises steeply, but the cape itself terminates in a low point. The coastal bank, on which the depths are less than 18 feet (5m5), extends about half a mile off the cape and the coast for about half a mile north-eastward of it; thence, it becomes narrower, and off Kum burnu, about 9 cables farther north-eastward, it extends about 1½ cables offshore. Two detached shoals with depths of 30 and 28 feet (9m1 and 8m5) over them, lie about 9 and 5 cables, respectively, westward of Kum burnu. 20

A detached 27-foot (8m2) patch lies about 9 cables south-westward of Yenişehir burnu and about 7 cables offshore; this patch, the coastal bank off Yenişehir burnu, and the 30-foot (9m1) shoal westward of Kum burnu lie nearly within the *red* sector of Mehmetçik burnu light between the bearings of 350° and 010°. 25

Kum burnu light is exhibited, at an elevation of 39 feet (11m9), from a white concrete tower, 13 feet (4m0) in height, situated on the western battery at Kum burnu. 30

Mehmetçik burnu (40° 03' N., 26° 10' E.) is the central of three steep points, all of a white colour, which together form the headland at the south-western extremity of Gelibolu yarımadası. Tekke burnu, the north-westernmost of these points, lies about three-quarters of a mile north-westward of Mehmetçik burnu and Kale burnu, the south-easternmost, lies about 6 cables east-south-eastward of the same point. This headland, although steep, is fronted by a sunken flat of rock and sand which, with depths of less than 18 feet (5m5) over it, extends up to 1½ cables offshore between Mehmetçik burnu and Kale burnu; several detached shoals with depths of 27 and 30 feet (8m2 and 9m1) over them, the positions of which may best be seen on the chart, lie about 3 cables offshore and a 34-foot (10m4) rocky shoal lies about half a mile south-westward of Kale burnu. 35 40

A light is exhibited, at an elevation of 164 feet (50m0), from a white stone tower, 82 feet (25m0) in height and fitted with a radar reflector, situated about one cable north-westward of the extremity of Mehmetçik burnu. 45

**Current.**—In the south-western entrance to the Dardanelles, between Kum burnu and Mehmetçik burnu, the main current sets west-south-westward at an average rate of about 1½ knots, with a maximum of 3 knots. It is stronger on the Asiatic side and runs with considerable strength along the edge of the bank extending from Yenişehir burnu. *See* also page 39. 50

**Anıt limanı.—Danger.—Light.**—Anıt limanı on the north-western side of the strait, is extended between Kale burnu (40° 02' N., 26° 11' E.) 55

*Charts 1608; 2429, with plan of Entrance to the Dardanelles.*

and Hisarlik burnu, a bold, steep white point about  $1\frac{1}{2}$  miles east-north-eastward. Except near its eastern end, the shore of the bight is low and sandy. The ruins of de Tott's battery stand on Hisarlik burnu and  
 5 within them is a cemetery in which there is a large white monument. The conspicuous War Memorial tower northward of Hisarlik burnu is described on page 86.

A large part of Anıt limanı is encumbered by a bank which, with depths of less than 18 feet (5m5), fronts the shore of the bight, extending  
 10 up to half a mile offshore abreast Seddülbahir and about 2 cables off the north-eastern shore. Anıt light is exhibited, at an elevation of 16 feet (4m9), from a white concrete tower, 16 feet (4m9) in height, situated near the edge of this bank, about 6 cables east-north-eastward of Kale burnu. A detached shoal with a depth of 20 feet (6m1) over it, lies 2 cables  
 15 eastward of the light.

**Kum burnu to the Narrows.—Coast.—Dangers.—Anchorages.—Lights.**—From Kum burnu, the south-eastern side of the strait trends east-south-eastward for about 2 miles and is low and swampy. Menderes çay, which rises at the foot of Kaz dağı, crosses the plain of Troy and  
 20 flows into the strait about  $3\frac{1}{2}$  cables eastward of Kum burnu lighthouse ( $40^{\circ} 01' N.$ ,  $26^{\circ} 12' E.$ ).

Mendere bank, a continuation eastward of the mudbank which fringes the coast around Kum burnu extends up to half a mile offshore eastward of it and is steep-to.  
 25 *Charts 2429, 1608.*

From the eastern end of the low land about 2 miles east-south-eastward of Kum burnu to Kanlıdere burnu, about 8 miles farther north-eastward, the south-eastern side of the strait is steep, cliffy and backed by hills from about 350 to 800 feet (106m7 to 243m8) high. From Kanlıdere burnu,  
 30 the coast trends north-eastward for about three-quarters of a mile to Dalyan burnu, a low, flat point, distinguished by its white appearance. There is a battery on its highest point and the ruins of a fort a short distance southward of it.

Kanlıdere Burnu light is exhibited, at an elevation of 33 feet (10m1), from  
 35 a round stone tower beside a white house, 33 feet (10m1) in height, situated about one cable northward of Kanlıdere burnu.

Erenköy liman, a bight entered between a point about  $3\frac{3}{4}$  miles eastward of Kum burnu and a point about 4 miles farther north-eastward, affords anchorage in almost any part but, as a general rule, vessels should avoid  
 40 anchoring in depths of less than 60 feet (18m3), as the depths decrease rapidly within this limit. A good berth is in depths of 16 fathoms (29m3), with the north-eastern part of the village of Erenköy, situated about 5 miles south-south-westward of Kanlıdere Burnu lighthouse, bearing  $149^{\circ}$ , about 3 cables offshore. Landing is possible in one or two indentations in the coast, and there is a pier with a depth of 3 feet (0m9) alongside  
 45 its outer end, about 2 miles north-north-eastward of the village of Erenköy, but see quarantine regulations, page 10.

Kepez bank, composed of mud and sand, fronts Kanlıdere burnu and extends up to 3 cables offshore close southward of that point. This  
 50 bank is a continuation of the shallow flat which fringes Erenköy liman, and there are depths of 9 feet (2m7) on its outer edge abreast Kanlıdere burnu.

When closely skirting Kepez bank in order to avoid the strength of the current, caution is necessary as the bank is steep-to. Vessels have  
 55 frequently been stranded here.

Anchorage may be obtained in depths of from 36 feet to 15 fathoms (11m0

*Chart 2429, 1608.*

to 27m4) in Kepez koyu, a bight immediately southward of Kanlıdere burnu.

On the north-western side of the strait between Hisarlık burnu and Karanfil burnu, about 5½ miles north-eastward, and thence to Kilitbahir about 4 miles farther north-eastward, the coast is everywhere steep and barren. Şarlayan dere flows through a small valley and enters the strait about midway between Karanfil burnu and Kilitbahir (40° 09' N., 26° 23' E.).

*Chart 2429, with plan of the Narrows.*

Namazgah fort is an earthwork situated about 2 cables southward of Kilitbahir, there is a battery about 2 cables farther south-westward. The point abreast Namazgah fort is free from danger but for about 2 miles south-westward the coast is fringed by a bank of sand and rock on which the depths are less than 18 feet (5m5). Harman kayasi, a rock with a depth of less than 6 feet (1m8) over it, and situated on the edge of this bank about 2¾ cables south-south-westward of Namazgah fort, is marked by a conical buoy, *see* caution on page 86.

Namazgah light is exhibited, at an elevation of 52 feet (15m8), from a white metal column, 13 feet (4m0) in height, situated on the eastern angle of Namazgah fort.

Anchorage may be obtained about 4 cables north-eastward of Karanfil burnu, 2 cables offshore in about 60 feet (18m3), partly in slack water. There is also anchorage about 1½ cables off the mouth of Şarlayan dere in slack water or the countercurrent, but it is not recommended except in an emergency.

Anchorage may be obtained about three-quarters of a mile south-westward of Namazgah fort, in depths of from 36 to 48 feet (11m0 to 14m6). This anchorage is easily identified by the many vessels seen there. Vessels should anchor at not more than 2 cables offshore as at a greater distance they would be in depths of from 25 to 30 fathoms (45m7 to 54m9) and in the main current.

Sarısığlar liman, on the south-eastern side of the strait, is entered between Dalyan burnu and the mouth of Çanakkale çay, about 2¼ miles north-north-eastward. The shores of this bay are fringed by a sand and mud bank which, with depths of less than 18 feet (5m5) over it, extends up to half a mile offshore in the southern part but becomes narrower northward and disappears altogether at the mouth of Çanakkale çay, on the northern side of which is Çanakkale kalesi and town. A fort fronts the shore about 4 cables south-eastward of Çanakkale kalesi.

A light is exhibited, at an elevation of 49 feet (14m9), from a white metal pylon, 46 feet (14m0) in height, situated on the north-western extremity of Çanakkale kalesi, about 2 cables northward of the mouth of Çanakkale çay (40° 09' N., 26° 24' E.).

Sarısığlar liman affords the best anchorage in the Dardanelles. Vessels should anchor in depths of 13 fathoms (23m8), mud, about three-quarters of a mile offshore and about 1½ miles southward of Çanakkale kalesi with its western wall bearing about 011°. For vessels of moderate draught the best anchorage is in the middle of the bay in depths of about 60 feet (18m3), with the eastern extremity of Namazgah fort bearing 333°, distant about 1½ miles.

Sarısığlar liman and the dangers within it, are covered by the red sector of Çanakkale light between the bearings of 341° and 027°.

*Charts 1608, 1659.*

**Directions for entering Dardanelles from south-westward.**—For directions for entering Dardanelles; *see* Mediterranean Pilot; 55 Volume IV.

*Chart 2429, plan of The Narrows.*

**THE NARROWS.**—**General remarks.**—The Narrows is the name given to that part of the Dardanelles between Çanakkale kalesi and Nara burnu, about 3 miles northward, on the east, and Kilitbahir and Bigalı kalesi, about 4 miles northward, on the west.

The northern side of the mouth of Çanakkale çay, on which stands the town of Çanakkale, is low and projects from the general line of the coast a short distance westward towards Kilitbahir, this point is free from danger. In this, the narrowest part of the Dardanelles, the depths are considerable, the nature of the bottom being sand, stones and shells, and both sides are steep-to.

**Çanakkale.**—**Light.**—**Piers.**—Çanakkale is the most important town on the Asiatic shore of the strait and is the seat of local government. It had a population, 1955, of 16,074.

Çanakkale kalesi is a massive quadrangular stone fort with a central keep; it stands on the eastern shore of the strait and on the northern bank of Çanakkale çay. In winter, Çanakkale çay carries with it a large quantity of sand and mud, giving a yellowish colour to all that part of the strait, but in summer it is nearly dry. Behind the town of Çanakkale, the land forms a plain, but about 3 miles inland, mountains on either side of the river rise to elevations of about 1,500 feet (457m2).

Çanakkale light ( $40^{\circ} 09' N.$ ,  $26^{\circ} 24' E.$ ) is described on page 89.

Dardan liman, on the eastern side of The Narrows, is entered between Çanakkale kalesi and a point on which stands an earthwork, situated about one mile north-north-eastward. Viewed from the strait, a clock tower near the northern end of the town of Çanakkale; a red building on the shore of Dardan liman, about  $5\frac{1}{2}$  cables north-eastward of Çanakkale light-structure; and a small turreted guardhouse on each side of a pier near the barracks, are all prominent marks.

The shores of the bight are fringed by a bank of gravel, sand and rock, which, with depths of from 3 feet to 12 feet (0m9 to 3m7), extends up to  $1\frac{1}{2}$  cables offshore; this bank is almost awash for a distance of about one cable from the northern entrance point of the bay. Outside the bank, the depths increase suddenly.

There are several piers in Dardan liman; of these, an L-shaped pier about 3 cables north-eastward of Çanakkale Kalesi light-structure is the largest and most modern and in 1967, was reported to accommodate vessels of about 7,000 tons gross. The other piers are suitable only for boats. There are several small landing places, mostly private.

**Anchorage.**—**Mooring buoys.**—Anchorage in Dardan liman is not good on account of the abrupt increase in depths immediately off the coastal bank, and, as vessels must necessarily anchor near the line of separation between the two currents, they will be in the eddies which abound between them.

There are four mooring buoys, from  $1\frac{1}{2}$  to 2 cables offshore, in the northern half of the bay, and thus there is little clear space available for anchorage.

**Pilotage.**—See pages 12 and 86.

**Facilities.**—Oil fuel is available.

Repairs can be undertaken.

**Communications.**—There is frequent communication by sea with Istanbul.

There is an airport, distant 12 miles, from Çanakkale.

There is a coast radio station at Çanakkale; see page 26.

**Climatic table.**—See page 71.

**Kilitbahir.**—**Light.**—**Port facilities.**—The town of Kilitbahir ( $40^{\circ}$

*Chart 2429, plan of the Narrows.*

09° N., 26° 23' E.) stands on the slopes of hills which rise from the south-western entrance to the Narrows to an elevation 676 feet (206m0). Kilitbahir castle, a stone fortress with a tall central keep, stands on sloping ground rising direct from the strait. The town is surrounded by cypress trees. 5

Namazgah light, near Kilitbahir, is described on page 89.

A mole with an elbow forms a small harbour at Kilitbahir; there is a wooden pier about 1½ cables southward of it and another small wooden pier projects about half a mile northward of the mole. There is a boat 10  
cambur with depths of from 4 to 5 feet (1m2 to 1m5) near Kilitbahir castle.

**Coast.**—On the northern side of Dardan liman, low hills rise to elevations of about 200 feet (61m0) close within the coast. Kösetabya (40° 10' N., 26° 24' E.), a stone fort in ruins, stands on a small low point which projects slightly from the general line of the coast, about 1½ miles 15  
northward of Çanakale light-structure.

**Nağra liman.—Dangers.—Light.—Piers.**—Nağra liman is entered between Kösetabya and Nara burnu, about 1½ miles northward. On the shore of the bay, a short distance eastward of Nara burnu is the large yellow building of a lazaretto and, about half a mile south-eastward of 20  
the same point, and on a range of low, grassy hills, is an old redoubt which, when seen from the bay, is a good mark.

Nara burnu is a long, low and sandy point which projects about 6 cables westward from the coastal range and is distinguished by Nağra kalesi, a large square fort standing close within it. The point terminates in a 25  
sharply-pointed sandbank, over which the depths increase gradually to a position about 2 cables from the parapet of the fort, and thence rapidly to 30 feet (9m1); farther offshore the depths again increase gradually to 36 feet (11m0), about 4½ cables from the fort. A 33-foot (10m1) patch lies 30  
4½ cables westward of the fort. The bank appears to extend much farther westward, but this appearance is due to discolouration. In July, 1949, a vessel drawing 20 feet (6m1) reported grounding in a position about 1½ cables westward of Nara burnu lighthouse.

A light is exhibited, at an elevation of 20 feet (6m1), from a white, octagonal, concrete tower, 20 feet (6m1) in height, situated on the sand 35  
spit, about three-quarters of a cable westward of the extremity of Nara burnu.

There are four piers in the northern part of Nağra liman between Nağra kalesi and Tekke, about three-quarters of a mile southward; two of these piers, situated near the barracks, have depths of 16 and 18 feet 40  
(4m9 and 5m5), respectively, off their outer ends.

In 1937, a floating crane of 100 tons capacity was stationed off Nağra kalesi.

**Light-buoy.**—A can light-buoy, painted black and white in chequers and surmounted by a black cone, exhibiting a *green flashing* light every 45  
*three seconds*, is moored on the eastern side of the Narrows, 1½ cables westward of Nara Burnu light-structure.

**Anchorage.—Mooring buoys.**—Good anchorage can be obtained, in depths of from 60 feet to 16 fathoms (18m3 to 29m3), between 2 and 4 cables off the coast between the northern entrance point of Dardan liman 50  
and Nara burnu. The best berth in Nağra liman is westward of Tekke landing place, about three-quarters of a mile southward of Nara burnu. Anchorage is also possible in depths of about 42 feet (12m8), about 3½ cables south-eastward of Nara lighthouse. There are two mooring buoys about half a mile south-eastward of Nara Burnu light. 55

**Currents.**—The whole of Nağra liman lies in the north-going counter-

*Chart 2429, with plan of the Narrows.*

current. The main current sets strongly west-south-westward over the outer end of the bank off Nara burnu. See also page 43.

- Kilitbahir to Kilya koyu.—Coast.—Lights.—Anchorages.**—From  
 5 Namazgah fort, the western side of The Narrows trends north-north-westward for about three-quarters of a mile to Değirmen burnu and thence a further  $1\frac{1}{2}$  miles north-north-westward to Eceabat. This stretch of coast is free from dangers and is steep-to except between  
 10 Kilitbahir and Değirmen burnu, where the coastal bank with depths of less than 18 feet (5m5), extends about one cable offshore, and for about half a mile on either side of Eceabat, where a similar bank, extends as much as  $1\frac{1}{2}$  cables offshore.

- A small but prominent earthwork stands close to the water's edge at Değirmen burnu, and about 9 cables farther north-north-westward is  
 15 Çam kalesi, an old stone fort, which is half hidden behind Çam burnu a slightly projecting cliff.

- Eceabat ( $40^{\circ} 11' N.$ ,  $26^{\circ} 22' E.$ ) is a small, partly ruined town situated on a low cliff at the eastern end of a valley at the foot of Kakma dağı, 430 feet (131m1) high, which forms the northern side of the valley. The  
 20 ruins of a large Greek church stand in the centre of the town and there are several windmills behind it. A factory, distinguished by its tall chimney, stands at the northern extremity of the houses. Abreast the middle of the town is a harbour for small craft which is protected from northward by a curved breakwater and from southward by a similar but  
 25 shorter breakwater.

A light is occasionally exhibited, at an elevation of 13 feet (4m0), from a grey framework tower, 10 feet (3m0) in height, situated on the head of the southern breakwater.

- A light is occasionally exhibited, at an elevation of 20 feet (6m1), from  
 30 the head of the northern breakwater from a similar tower.

The entrance to Kilya koyu lies between 4 and 9 cables north-eastward of the northern end of Eceabat; the bare slopes of Kakma dağı and Kilya tepe rise steeply from the south-western and north-eastern shores, respectively, of the bight.

- There are three jetties at the head of this bight, all of which were, in 1948, in a poor state of repair; the south-western jetty has a depth of 8 feet (2m4) at its outer end which is 20 feet (6m1) wide and on which there is a  $3\frac{1}{2}$ -ton hand derrick; the central jetty has a seaward face 130 feet (30m6) in length with a depth of 16 feet (4m9) alongside; and the north-eastern jetty has a depth of 22 feet (6m7) alongside its outer end which is  
 40 40 feet (12m2) wide.

*Chart 2429.*

- Maltepe, situated about  $1\frac{1}{2}$  miles north-north-westward of the head of Kilya koyu, is a prominent conical hill, 548 feet (167m0) high, which has  
 45 the appearance of a large tumulus.

*Chart 2499, plan of The Narrows.*

- Anchorage may be obtained off Eceabat in depths of 17 fathoms (31m1), about 2 cables offshore abreast the chimney of the factory; the coastal bank extends less than one cable offshore in this vicinity. This anchorage  
 50 is not recommended as the current in the locality is variable.

There is anchorage in the middle of Kilya koyu, in a depth of about 14 fathoms (25m6), the shore being moderately steep-to. Being subject to squalls, this anchorage is seldom used.

- Poyraz Burnu light is exhibited, at an elevation of 23 feet (7m0), from  
 55 a white concrete tower, 20 feet (6m1) in height, situated three-quarters

*Chart 2499, plan of The Narrows.*

of a cable offshore, about 3 cables eastward of the north-eastern entrance point of Kilya koyu.

**Submarine cable.**—A submarine cable crosses the strait between Çanakkale and Kilitbahir ( $40^{\circ} 09' N.$ ,  $26^{\circ} 23' E.$ ). 5

**Coast.—Light.**—From the north-eastern entrance point of Kilya koyu, the north-western side of the strait trends north-eastward for about one mile to Bigalı kalesi, an old, quadrangular, whitewashed fort with a prominent central minaret. Bigalı kalesi stands on the north-eastern side of a slightly projecting, low, flat, and rounded point, which is formed at the entrance to a valley. A stream flows down this valley. 10

A bank on which the depths are less than 18 feet (5m5) fringes the coast between Kilya koyu and Bigalı kalesi, extending up to  $1\frac{1}{2}$  cables off the south-western part of this stretch of coast.

**NORTH-EASTERN PART OF THE DARDANELLES.—Nara burnu to Uzun burnu.**—**Light.**—**Submarine cable.**—The range of low, grassy hills mentioned on page 91, which extends northward from close within Dardan liman on the eastern side of the strait, terminates about 7 cables east-north-eastward of Nara burnu, in a point about 100 feet (30m5) high, which appears green or yellow according to the season. A bank of sand and rock with depths of less than 18 feet (5m5) over it, the outer edge of which is steep-to, extends up to one cable off the coast between Nara burnu and the 100-foot (30m5) point. 15 20

*Chart 2429.*

Abidos burnu on the southern side of the strait about  $1\frac{1}{2}$  miles eastward of the 100-foot (30m5) point, is low, white and rocky and is composed of oyster shells. A prominent clump of fir trees stands about one mile south-south-westward of Abidos burnu. 25

Between Bigalı kalesi and a steep, bluff point about  $1\frac{1}{2}$  miles east-north-eastward, the north-western side of the strait is fringed by a narrow, steep-to bank and backed by hills from about 150 to 370 feet (45m7 to 112m8) high, rising farther inland to an elevation of about 680 feet (207m3). 30

Close within the steep, bluff point is an embankment about 20 feet (6m1) high, on which there is a road. Standing at an elevation of about 300 feet (91m4) on the slopes of Taşocağı tepesi, which rises within this point and forms the western side of a valley through which flows Kayaaltı dere, is Akbaş kalesi, the ruins of an old Byzantine castle. This castle is not easily distinguished as its walls are of the same colour as the surrounding ground, but a monastery adjoining it, which is enclosed by plane trees and cypresses, indicates its position. 35 40

Akbaş light is exhibited, at an elevation of 16 feet (4m9), from a white triangular tower, 16 feet (4m9) in height, situated at the water's edge at the foot of the steep, bluff point.

Akbaş limanı is entered between Akbaş light-structure and a low point about three-quarters of a mile north-eastward; its northern shore, through which Kayaaltı dere enters the bay, is low and sandy. 45

A submarine cable crosses the strait between Abidos burnu and a position close north-eastward of the north-eastern entrance point of Akbaş limanı.

Between the north-eastern entrance point of Akbaş limanı and Uzun burnu, a low point close to the mouth of Ilgardere çayı, about  $3\frac{1}{2}$  miles north-eastward, the north-western side of the strait rises steeply to a central peak, 830 feet (253m0) high, named Bakacak tepe, which from most directions appears as a distinctive cone. Uzun burnu is very low and is fringed by a narrow bank which, with depths of less than 18 feet (5m5), 55



*Chart 2429.*

fronts the coast for about  $2\frac{1}{2}$  miles south-westward and extends as much as  $1\frac{1}{2}$  cables offshore.

On the south-eastern side of the strait between Abidos burnu and the mouth of Yapıldak çay, about 3 miles east-north-eastward, the coast is low, and in many places, is swampy in winter. Kaya burnu ( $40^{\circ} 12' N.$ ,  $26^{\circ} 28' E.$ ), about one mile eastward of Abidos burnu is similar to it in appearance, being low and formed of white rock. Within this low coast the hills rise gradually to the pyramidal peak of Aghı Dağ (chart 224), 3,010 feet (917m4) high, about 9 miles inland. This part of the country is poorly cultivated, the valleys and slopes of the hills are extensively wooded and there are several scattered villages. None of these villages is prominent except in certain lights, when the white minarets and mills show up well. Only a minaret and a few houses of Yapıldak village, situated about  $1\frac{1}{2}$  miles eastward of the mouth of Yapıldak çay, are visible from the strait over the surrounding trees.

Değirmen dere flows into the strait about  $1\frac{1}{2}$  miles east-north-eastward of Kaya burnu. The mouth of Yapıldak çay may be identified by a flat piece of land immediately north-eastward of it. Both these streams, though not absolutely dry, cease flowing in summer, and except during floods, are small.

From the mouth of Yapıldak çay, the south-eastern side of the strait trends north-eastward for about  $2\frac{1}{2}$  miles to Kunduzkaya, a prominent headland of white rock, 70 feet (21m3) high, which is the only rocky point in this vicinity.

**Banks.—Anchorages.**—Between the 100-foot (30m5) point about 7 cables east-north-eastward of Nara burnu and the mouth of Yapıldak çay, the south-eastern side of the strait is fronted by a bank, which with depths of less than 18 feet (5m5) over it, extends up to half a mile offshore between Abidos burnu and Kaya burnu. Abidos bankı, the western part of this coastal bank, has a least depth of 8 feet (2m4) and extends as much as  $4\frac{1}{2}$  cables offshore between positions about three-quarters of a mile and  $1\frac{1}{2}$  miles westward of Abidos burnu.

Musa bankı, a projection northward of the coastal bank, lies off the mouth of Yapıldak çay and extends, with depths of less than 36 feet (11m0) over it, up to 7 cables offshore.

The summit of Kakma dağı (page 92) bearing  $260^{\circ}$  and a little open northward of the 100-foot (30m5) point about 7 cables east-north-eastward of Nara burnu, leads close northward of Abidos bankı and the coastal bank eastward of it in a least depth of 24 feet (7m3).

The prominent clump of fir trees south-south-westward of Abidos burnu (page 93), bearing  $226^{\circ}$  and in line with Kaya burnu, leads north-westward of Musa bankı in a depth of 15 fathoms (27m4).

There is anchorage, well sheltered from all southerly winds, eastward of Abidos bankı and clear of the submarine cable, but vessels should not lie here in north-westerly winds if these are at all stormy.

North-eastward of Musa bankı vessels can approach within  $2\frac{1}{2}$  cables of the coast as far as Kunduzkaya. There is good anchorage along this coast, especially between Kaya burnu and the mouth of Yapıldak çay, in depths of about 12 fathoms (21m9), mud.

**Uzun burun to Dalyan burnu.—Lights.—Anchorages.**—İlgardere çayı flows into a bight open eastward to the prevailing winds, which is entered on the north-western side of the strait close northward of Uzun burun. In winter this is a considerable stream but in summer it is only a small rivulet.

From Uzun burun, the coast trends east-north-eastward for about

*Chart 2429.*

5 miles to Karakova burun. This stretch of coast is steep-to and can be approached within one cable except off two small bights about  $1\frac{1}{2}$  and  $1\frac{3}{4}$  miles, respectively, south-westward of Karakova burun, where depths of less than 18 feet (5m5) extend about one cable offshore. Within the coast, the land rises steeply to a ridge culminating in Sarıyarlar tepe (40° 19' N., 26° 32' E.), 1,024 feet (312m1) high. 5

Karakova light is exhibited, at an elevation of 33 feet (10m1), from a white metal column, 33 feet (10m1) in height, situated at the water's edge close north-eastward of Karakova burun. 10

Karakova burun is low and sandy with considerable depths about one cable off it; it forms the north-eastern entrance point of Cumalı iskelesi, a bay of which the south-western entrance point lies about one mile farther south-westward.

A bank on which the depths are less than 18 feet (5m5) extends about  $1\frac{1}{2}$  cables from the head of Cumalı iskelesi. The western side of the bay is moderately high, the spurs of Hora tepe, 761 feet (231m9) high, sloping down to it, but its northern and eastern sides are low. There is a small jetty at the head of the bay with a depth of 12 feet (3m7) at its outer end. 15

Good anchorage, protected from north-easterly winds can be obtained in the middle of Cumalı iskelesi, in depths of from 42 to 54 feet (12m8 to 16m5), about 3 cables offshore. 20

On the eastern side of the strait Saltik limanı, a bight in which is Umurbey iskelesi, is entered between Kunduzkaya (page 94) and a low, sandy point about 7 cables north-north-eastward. A clump of trees stands at an elevation of 617 feet (188m1) on the summit of Kosedede tepe about  $1\frac{1}{2}$  miles, south-eastward of the head of the bight, is prominent from the strait, but from close inshore the clump is hidden by the coastal hills. A pier with a depth of about 18 feet (5m5) at its outer end, projects from the shore of the bight about  $1\frac{1}{2}$  cables southward of the north-eastern entrance point. 30

Vessels anchoring off Umurbey iskelesi should be careful not to proceed too far into Saltik limanı as depths of less than 18 feet (5m5) extend up to  $2\frac{1}{2}$  cables from its head and thence increase abruptly to 42 feet (12m8). The best berth is in depths of 14 fathoms (25m6), mud, with the light-structure on Gocuk burnu (see below) just open north-north-westward of the low, sandy north-eastern entrance point of the bight. 35

Close north-eastward of Saltik limanı is another bight, which has a low and sandy shore. It is obstructed by a sandbank with depths of only 9 feet (2m7) over its outer edge, which extends about one cable outside a line joining its entrance points; this sandbank has been formed by the deposit from Çatalazmak, a stream which flows into the head of the bight and which is only a lagoon in summer, but in winter is fed by water from the Kangırlı hills southward. 40

Gocuk burnu, a point about three-quarters of a mile north-eastward of the mouth of Çatalazmak, is low, flat and rounded; it is moderately steep-to, the coastal bank here extending not more than half a cable offshore. The point forms the lower end of the extensive valley and plain of Umurbey through which flows Umurbey çay, which enters the strait about one mile east-north-eastward of Gocuk burnu. The mouth of this river is never entirely dry. 45 50

A light is exhibited, at an elevation of 39 feet (11m9) from a white metal mast, 30 feet (9m1) in height, situated on the extremity of Gocuk burnu (40° 17' N., 26° 34' E.).

A bank formed by the deposit from Umurbey çay is situated close eastward of the mouth of that river; over this bank depths of less than 55

*Chart 2429.*

18 feet (5m5) extend about 5 cables offshore, and of less than 30 feet (9m1), a further 5 cables. Good temporary anchorage may be obtained on the outer part of this bank, in depths of from 24 to 27 feet (7m3 to 8m2); the holding ground is good.

*Chart 2429, 1004.*

On the north-western side of the strait, about half a mile north-eastward of Karakova burun, is the mouth of Cumalı deresi; in winter, the whole of the coast in the vicinity is swampy.

- 10 Between Sanyarlar tepe (page 95) and Cumalı deresi, are the villages of Burhanlı and Cumalı köyü but they are not visible from the strait until north-eastward of Karakova burun.

From the mouth of Cumalı deresi, the coast trends north-eastward for about 3 miles to Galata burun and is steep-to with a sandy beach. The villages of Galata and Bayırköy, about half a mile and  $1\frac{1}{2}$  miles, respectively, inland, are prominent, as they are situated on the summit of the coastal ridge rising within this stretch of coast. There are a number of windmills close to both villages.

- 20 A light is exhibited, at an elevation of 13 feet (4m0), from a white concrete tower, 13 feet (4m0) in height, situated about half a mile south-south-westward of Galata burun.

Galata burun is low and within it is a plain at the entrances to the valleys of Cevizlik dere and Münipbey deresi, between which, and about 3 miles north-westward of the point, is Akyalar dağı 1,024 feet (312m1) high, with white and yellow chalk cliffs.

- From a position about one mile eastward of the mouth of Umurbey çay the south-eastern side of the strait trends north-eastward for about 5 miles to the mouth of Lapseki çay. This stretch of coast is low and composed of either sand or shingle, but the land within it rises, steeply at first and thence more gradually, to the summit of Leskioi tepesi (chart 224), 1,230 feet (374m9) high, about 3 miles inland; the slopes of this mountain are clothed with short and scrubby brushwood.

- Lapseki limanı is entered between a slight projection of the coast at the mouth of Lapseki çay, and Dalyan (Çardak) burnu ( $40^{\circ} 22' N.$ ,  $26^{\circ} 41' E.$ ), about one mile north-eastward, the latter point forms the western extremity of a low plain extending from the foot of the hills inland. There are some windmills on the shore of the bight about 3 cables south-south-eastward of Dalyan burnu.

- Lapseki is a small town surrounded by trees on the southern shore of the bight and contains a prominent mosque and minaret. It stands on slightly rising ground at the northern end of a plain backing the coast for about 2 miles south-westward, through which Lapseki çay flows into the strait.

- Good anchorage, sheltered from north-easterly winds, may be obtained in Lapseki limanı, but caution is necessary as a bank with depths of less than 18 feet (5m5) fronts the head of the bay and extends as much as 3 cables off the eastern and southern shores. The best berth is in depths of 19 fathoms (34m7), about 6 cables south-south-westward of Dalyan burnu. In this position slack water, or an eddy current never very strong, will be found and there is good protection from the swell from Marmara denizi. The north-eastern shore of the bight is steep-to.

- GELIBOLU BOĞAZI.—General remarks.**—Gelibolu boğazı is at the north-eastern end of the Dardanelles and connects it with Marmara denizi. The limits of this strait may be considered to be lines joining Galata burun and Dalyan burnu ( $40^{\circ} 22' N.$ ,  $26^{\circ} 41' E.$ ) on the south

*Charts 2429, 1004.*

and Çanyaka burnu and Eakifiner tepe (Fanous hill) ( $40^{\circ} 24' N.$ ,  $26^{\circ} 46' E.$ ) enclosing Zincirbozan bank on the north.

A shoal with a depth of 42 feet (12m8) over it was reported, in 1959, to exist in mid-channel at the eastern end of Gelibolu boğazı, about  $2\frac{1}{2}$  miles northward of Eakifiner tepe. 5

**Gelibolu Limanı. — Dangers. — Light. — Anchorages.** — Gelibolu limanı, on the north-western side of the strait, is entered between Galata burun and the southern extremity of a promontory on which stands the town of Gelibolu, about 3 miles north-eastward; together with the coast north-eastward to Çankaya burnu, it forms the north-western side of Gelibolu boğazı. 10

Gelibolu limanı is divided into two nearly equal parts by a point which projects about 4 cables south-eastward from the general line of the coast. Its shores consist, for the most part, of yellow cliffs about 80 feet (24m4) high, with small ravines between them and cultivated slopes farther inland. The south-western part of the bay is fringed by a rocky flat, nearly awash in some places, which extends as much as 3 cables offshore. 15

Middle bank fronts the head of the north-eastern half of the bay; on it depths of 8 to 18 feet (2m4 to 5m5) extend up to  $3\frac{1}{2}$  cables offshore in places; it is steep-to. A tall chimney near a bridge close within the coast, bearing  $024^{\circ}$  and in line with the easternmost row of mills northward of the town, leads eastward of this bank. This bridge is built of wood and spans a small stream which flows into the bay about 6 cables west-north-westward of the southern extremity of the town. About 4 cables west-south-westward of the mouth of this stream is a small jetty with a depth of 8 feet (2m4) at its outer end. 20 25

The southern extremity of the promontory on which the town is built, and the seaward face of the town as far as the lighthouse, about 4 cables north-eastward, is rocky. Foul ground extends from the southern extremity of the promontory to a rock with a depth of 12 feet (3m7) over it about  $1\frac{1}{2}$  cables south-westward; this rock is steep-to. 30

Gelibolu light ( $40^{\circ} 25' N.$ ,  $26^{\circ} 41' E.$ ) is exhibited, at an elevation of 111 feet (33m8), from a white stone tower, 30 feet (9m1) in height, situated on a cliff at the north-eastern end of the town. 35

Gelibolu limanı is much frequented by local craft as a temporary anchorage. It is well protected from all winds except those between south and east; these winds however raise but little sea and the holding ground is good. The best berth is close eastward of Middle bank where good holding ground is found in depths of about 66 feet (20m1), with the southern extremity of the Gelibolu promontory bearing  $090^{\circ}$ , distant about 6 cables. Small craft may anchor nearer the town observing that the shorebank extends about  $1\frac{1}{2}$  cables offshore abreast the bridge mentioned above. The swell from Marmara denizi sets around the southern extremity of the promontory at times. 40 45

**Gelibolu town. — Landmarks.** — Gelibolu is the largest town on the European shore of the Dardanelles and is the seat of local government. It had a population, in 1955, of 12,481.

The most prominent marks in the town are:—The tall chimney near the bridge mentioned above; a tall minaret seen on the skyline; and a ruined belfry south-westward of the lighthouse. 50

**Regulations.**—Vessels must inform the harbour authorities of their expected arrival at least 24 hours beforehand; vessels carrying explosives must give three days notice of the precise date of arrival. Other special harbour regulations are in force. 55

Vessels with inflammable or explosive cargoes must anchor in Bağçeşme

*Charts 2429, 1004.*

limani (*see below*), or westward of a line drawn southward from a position on the coast 9 cables westward of Gelibolu light-structure.

**Quarantine.**—The Health office is a yellow building standing just westward of the entrance to the port about 2 cables west-north-westward of the southern extremity of the town. Vessels in quarantine are not given pratique here unless it has been already given at Çanakale or Istanbul; they are permitted to take in provisions or send telegrams providing they have health guards on board. *See also* pages 9–13.

**Port facilities.—Trade.**—On the southern side of the town there are two small cambers; the outer one has a depth of 6 feet (1m8) with an entrance 30 feet (9m1) wide; the inner one is not much used. Close westward of the entrance to the outer camber is an L-shaped military pier, capable of accommodating vessels up to 250 feet (76m2) in length, with depths of 42 and 30 feet (12m8 and 9m1) along the outer and inner faces, respectively, of its outer arm. Water is plentiful and a small stock of coal is kept.

Exports consist of cereals, wine, aniseed, linseed, etc.; imports are rice, oil, leather, tobacco, etc.

**Submarine cable.**—A submarine cable crosses the strait between Dalyan burnu (40° 22' N., 26° 41' E.) and a position about 2½ miles south-westward of Gelibolu lighthouse.

**Bağçeşme limanı.—Anchorage.**—Bağçeşme limanı, on the north-western side of the strait, lies on the north-eastern side of the town of Gelibolu and is entered between Gelibolu lighthouse and Çankaya burnu, a rocky point about 25 feet (7m6) high about one mile north-eastward. The western shore of this bay consists of a sandy beach about 4 cables long, with rocky points at either end; thence to Çankaya burnu, the shore is rocky. A bank on which the depths are less than 18 feet (5m5), and on which north-easterly winds raise a heavy surf, fringes the western side of the bay, extending about 1½ cables offshore. Foul ground, over which the sea is usually discoloured, extends about one cable southward of Çankaya burnu. Landing can generally be effected at the north-western corner of the bay, under the lee of a rocky point near a fountain which gives its name to the bay.

There is anchorage in Bağçeşme limanı, in a depth of about 13 fathoms (23m8), about 2½ cables offshore, with Gelibolu lighthouse bearing about 220°. There is no protection here from north-easterly winds and a considerable swell sets in whilst the holding ground is not so good as that in Gelibolu limanı.

The coast eastward of Çankaya burnu is described on page 102.

**Signal station.**—A signal station, consisting of a small white tower, is situated on Çankaya burnu.

**Coast.—Light.—Dangers.—Anchorage.**—From Dalyan burnu, the south-eastern side of the strait trends north-eastward for about 1½ miles to the entrance to Çardak lagoon. Çardak village stands on the southern side of the entrance on a well-cultivated plain which backs this part of the coast, within which the hills of Kizilbayir rise to an elevation of 830 feet (253m0). There is a domed mosque in the village.

Çardak lagoon lies on the southern side of a narrow strip of sand which extends west-south-westward for about 1½ miles from the mainland about 3 miles north-eastward of Dalyan burnu; Çardak burnu, the western extremity of this strip, is steep-to on its southwestern side.

Çardak light is exhibited, at an elevation of 38 feet (11m6), from a white iron column on a square building, 30 feet (9m1) in height, situated about 1½ cables north-eastward of Çardak burnu.

*Charts 2429, 1004.*

Çardak limanı is entered between Dalyan burnu ( $40^{\circ} 22' N.$ ,  $26^{\circ} 41' E.$ ) and Çardak burnu about  $1\frac{1}{2}$  miles north-eastward. The whole of the southern side of this bight is fronted by a bank which, with depths of less than 18 feet (5m5) extends up to  $3\frac{1}{2}$  cables offshore.

Çardak bankı, with depths of from 24 to 30 feet (7m3 to 9m1) over it and steep-to, extends between about 4 cables north-north-westward, and 7 cables north-eastward of Çardak light-structure. A shoal with a depth of 24 feet (7m3) over it was reported, in 1965, to lie 6 cables north-north-westward of Çardak light-structure. Between Çardak bankı and Zincirbozan bank (*see below*), the 20-fathom (36m6) line is reported to lie up to 3 cables farther north-westward than charted.

From Çardak light-structure, the coast trends east-north-eastward and is low for about  $3\frac{1}{2}$  miles to Eskifiner tepe (Fafîous hill) where there are some low cliffs. Eskifiner tepe, on which stands the ruins of an old lighthouse, is a small, isolated hill, 95 feet (29m0) high, with a cliff forming its seaward face.

**Prohibited anchorage.**—Anchoring and fishing are prohibited in an area indicated on the chart extending across Gelibolu boğazi.

*Chart 1004.*

**Zincirbozan bank.**—**Light.**—**Clearing marks.**—Zincirbozan bank extends, with depths on it of less than 30 feet (9m1), about 11 cables offshore, between Çardak light-structure and a position about one mile eastward of Eskifiner tepe.

The north-western edge of Zincirbozan bank is steep-to. Near the northern edge of the bank, between about  $1\frac{1}{2}$  miles north-westward, and one mile northward of Eskifiner tepe ( $40^{\circ} 24' N.$ ,  $26^{\circ} 46' E.$ ), there are several patches with depths of from 18 to 24 feet (5m5 to 7m3) over them; outside these patches the depths increase rapidly from 30 feet (9m1) to 15 and 25 fathoms (27m4 and 45m7).

A light is exhibited at an elevation of 34 feet (10m4), from a structure situated about one mile northward of Eskifiner tepe and marks the northern edge of Zincirbozan bank.

Gelibolu lighthouse bearing  $257^{\circ}$  and in line with the centre of the remarkable white chalk cliffs near the 1,024 feet (312m1) summit of the rounded Akyalar dağı (page 96), leads northward of Zincirbozan bank very close to the position of the light-structure. Care must be taken not to bring the lighthouse northward of the centre of these cliffs. This mark is easily distinguished, the Gelibolu light-structure being white and the cliffs also generally show white. After rain however, they will appear of a reddish-yellow colour and are then not so prominent a mark.

Çardak light-structure bearing  $218^{\circ}$ , leads westward of the north-western edge of Zincirbozan bank.

Vessels proceeding eastward must be careful not to pass southward of the clearing mark for the northern part of the bank until the highest part of some white cliffs, about  $1\frac{1}{2}$  miles eastward of Eskifiner tepe bears  $135^{\circ}$ .

The coast eastward of Eskifiner tepe is described above.

*Chart 2429.*

**DIRECTIONS.**—**Cautions.**—*See General Regulations*, on pages 9–13; Navigation in Dardanelles on page 12; Speed on page 13; and references on page 86.

**Ægean sea to Gelibolu.**—Directions for approaching the Dardanelles are given in Mediterranean Pilot, Volume IV. The current in the Narrows of Çanakkale sets less strongly in the centre of the strait than near its sides.

*Chart 2429.*

At night, vessels approaching the Narrows from southward should keep within the *white* sector of Çanakkale light bearing more than 027°.

Vessels should give Nara burnu a good berth as the bank off it extends  
5 beyond the lighthouse and the current sets on to the point.

For directions through Marmara denzii, see pages 135 and 136.

**Gelibolu to the Ægean sea.**—If south-westerly winds are too strong to permit vessels to proceed into the Ægean sea, they should anchor off the south-eastern side of the strait in one of the good anchorages referred to.

## CHAPTER III

## MARMARA DENİZİ AND İZMİT KÖRFEZİ.

*Chart 224.*

**MARMARA DENİZİ.**—General remarks.—Marmara denizi communicates with the *Ægean* sea by the Dardanelles and with the Black sea by the Bosphorus, known to the Turks as Karadeniz or İstanbul boğazı. The general easterly and westerly trend of its southern shore is broken 5  
by Kapıdağı (Kapu dagh) yarımadası.

Marmara denizi is bordered almost entirely by high and mountainous land. It terminates eastward in the two gulfs, İncir limanı (Indjir liman) and İzmit (Izmid) körfezi, which are separated by a mountainous peninsula. There are two other gulfs, Erdek (Artaki) körfezi and Bandırma 10  
(Peramo) körfezi; the former westward, and the latter eastward of Kapıdağı yarımadası; these are separated by a narrow isthmus.

There are several islands in this sea. The westernmost group, consisting of Marmara adası and Paşa Limanı adalar (page 113) lies a short distance north-westward of Kapıdağı yarımadası. The most important island of 15  
the group is Marmara adası which has given its name to the sea, which it divides into two channels of unequal width.

The next group eastward, Mola adaları, consists of three small islands lying close off the eastern extremity of Kapıdağı yarımadası.

İmralı adası lies, by itself, off the entrance of İncir limanı abreast the 20  
mouth of Koca (Maolitch) dere.

The third group includes Kızıl (Princes) adalar and is composed of nine islands, of which the largest is Büyükada (Prinkipo) ( $40^{\circ} 52' N.$ ,  $29^{\circ} 07' E.$ ), lying parallel to the coast, on the eastern side of the approach to the Bosphorus. 25

**Regulations.**—General regulations for the passage through Marmara denizi are given on pages 9-13.

**Currents.**—See page 39-48.

**Communications.**—There is sea communication between most of the coastal towns and villages on the shores of this sea and İstanbul. 30

**Winds and weather.**—Winds from about north-east are the most frequent. The occasional interruptions of these winds by winds mainly from some southerly point, and the resulting weather, are similar to those that take place in the Dardanelles, see page 57. When the north-easterly winds in Marmara denizi reach gale force, they raise a short cross sea which compels sailing vessels to seek shelter among the islands southward, or off Gelibolu if they have not reached Marmara adası. The 35  
"meltem" is more regular in the north-eastern part than in the western and southern parts; sometimes, even when it is a fresh breeze, it will not blow home to the southern shore. Close to the European shore it is often 40  
diverted by the sea breeze so as to blow along the coast.

**Submarine Exercise areas.**—Submarines exercise frequently in the eastern portion of Marmara denizi within areas, indicated on the chart, bounded by Latitudes  $40^{\circ} 36' N.$  and  $40^{\circ} 50' N.$ , and by Longitudes  $28^{\circ} 00' E.$  and  $29^{\circ} 07' E.$  A good lookout should be kept for them when passing 45  
through these waters; see page 21.



*Chart 1004.*

**NORTHERN SHORE OF MARMARA DENİZİ.**—Çankaya burnu to Doğanaslan burnu.—Coast.—From Çankaya burnu ( $40^{\circ} 25' N.$ ,  $26^{\circ} 42' E.$ ) (page 98), the north-western entrance point of Gelibolu boğazi,

- 5 a sandy beach trends northward for about 2 miles. An isolated rocky outcrop, named Çan kaya, is situated on the beach about 5 cables northward of Çankaya burnu. Eastward of the northern end of this beach, a bank with depths of less than 18 feet (5m5) extends up to  $3\frac{1}{2}$  cables offshore but gradually narrows to a width of about one cable at about  $1\frac{1}{2}$  miles farther  
10 east-north-eastward. Within this stretch of coast is a well-cultivated plain.

- For about 2 miles north-eastward of the northern end of the sandy beach, the coast is closely backed by the lower slopes of Karayokus tepesi and thence trends east-north-eastward for about 6 miles to Doğanaslan burnu (Doğan Arslan) burnu. Bolayır, a large village on the northern side  
15 of the coastal range, about  $4\frac{1}{2}$  miles westward of Doğanaslan burnu, cannot be seen from off the coast, but the tops of its minarets may be visible from a considerable distance eastward.

- Doğanaslan burnu ( $40^{\circ} 31' N.$ ,  $26^{\circ} 52' E.$ ) rises to an elevation of 95 feet (29m0) in sloping yellow cliffs; this point is ill-defined and can only  
20 be distinguished as a point from close inshore. Doğanaslan farmhouse, a white building, stands on rising ground at an elevation of 490 feet (149m3), about  $1\frac{1}{2}$  miles northward of the point. Mal tepe, a conical mound 66 feet (20m1) in height and a good mark, stands on a spur of the Maslak (Magarislik) hills at an elevation of 740 feet (225m6), about  
25 three-quarters of a mile north-westward of the farmhouse.

- Doğanaslan bankı.**—Doğanaslan bankı consisting of sand and rock with depths of less than 18 feet (5m5), extends  $6\frac{1}{2}$  cables off the coast about half a mile south-westward of Doğanaslan burnu; there are depths of 9 feet (2m7) in places about half a cable within its outer edge. The southern  
30 extremity of the town of Gelibolu bearing  $239^{\circ}$ , and in line with the notch formed by the valley between Akyalar dağı, page 96, and the next summit southward, leads in depths of about 54 feet (16m5) southward of this bank.

In 1966, a rock, with a depth of 6 feet (1m8) over it, was reported to lie  $6\frac{1}{2}$  cables south-south-eastward of Doğanaslan burnu.

- 35 **Doğanaslan burnu to Koca burnu.**—Lights.—Dangers.—Anchorages.—Caution.—From Doğanaslan burnu, the coast trends east-north-eastward for about 7 miles to İnceburun (Ince burnu) ( $40^{\circ} 33' N.$ ,  $27^{\circ} 00' E.$ ). At first it is sandy and backed by low cliffs similar to those at Doğanaslan burnu, but it soon becomes lower and in some places,  
40 swampy. Tahta tepe (Magarislik), a peak 919 feet (280m0) high, lies about  $2\frac{1}{2}$  miles northward of Doğanaslan burnu and slopes eastward. The village of Ortaköy (Eksemil), of which only a few mills can be seen from close off the coast, stands at an elevation of 520 feet (158m5) on a spur of this hill about 2 miles north-eastward of the summit.

- 45 İnceburun is a cliffy point 65 feet (19m8) high, within which the land rises gradually to Helvacı (Halvace) tepe, the western end of a range which extends parallel with the coast and culminates about 9 miles east-north-eastward in the peak of Doluca tepe (Aya İlyâ dağı, see page 103.

- A light is exhibited, at an elevation of 105 feet (32m0), from a white  
50 concrete tower on the extremity of İnceburun.

A bank on which the depths are less than 30 feet (9m1) extends about half a mile southward of İnceburun, with depths of from 12 to 16 fathoms (21m9 to 29m3) close off its outer edge; an 18-foot (5m5) rocky patch lies near the edge of this bank about 6 cables west-south-westward of

- 55 İnceburun light-structure.

Good anchorage may be obtained in depths of about 48 feet (14m6),

*Chart 1004.*

with Inceburun light-structure bearing about  $063^\circ$ , distant one mile.

From Inceburun ( $40^\circ 33' N.$ ,  $27^\circ 00' E.$ ), the coast trends east-north-eastward for about 9 miles to Eriklice burnu. On the western part of this stretch of coast, the land rises from low cliffs to the range extending between Helvacı tepe and Doluca tepe, but the eastern part is backed by a low plain which extends inland for as much as three-quarters of a mile to the foot of the range and is subject to inundation, particularly in summer. Kızılcalerzi köyü is visible on rising ground at an elevation of 420 feet (128m0) about 2 miles north-north-westward of Inceburun light-structure. The town of Sarköy is situated on the low plain close within the coast about  $6\frac{1}{2}$  miles east-north-eastward of Inceburun; there are several mosques and churches in the town and some mills on the coast both eastward and westward of it. There is a small pier abreast the centre of Sarköy.

The village of Araplı stands at an elevation of 880 feet (268m2) about 2 miles north-westward of Eriklice burnu; it is situated on the slopes of Araplı tepe and is a prominent mark.

Doluca tepe (Aya İlyâ dağ), a remarkable peak 2,255 feet (687m3) high, rises about 3 miles northward of Eriklice burnu; although not so high as some summits of Ganos dağları, *see* below, its shape and comparatively isolated position make it a good mark.

Eriklice burnu is the southern entrance point of a small bight on the shore of which, about half a mile north-north-eastward of the point, is the town of Eriklice. The point is low and sandy, and a coastal bank with depths of less than 30 feet (9m1), extends about  $2\frac{1}{2}$  cables offshore from it. A 6-foot (1m8) patch is charted close within the edge of the bank about  $3\frac{1}{2}$  cables eastward of the town of Eriklice. Eriklice burnu should be given a good berth, particularly in hazy weather, *see* remarks on currents, pages 44-45. Within Eriklice burnu the land is flat for about half a mile and thence rises steeply to Araplı tepe.

*Charts 1004, 2605.*

Between Eriklice burnu and Hoşköy (Hora) burnu, about 8 miles north-eastward, the coast, though backed by high hills the lower spurs of which rise almost immediately from the sea, is in no part cliffy, but from Gaziköy, a town about 2 miles north-north-eastward of Hoşköy burnu, to Koca (Kodja) burnu, a fine bluff headland about 8 miles farther north-eastward, cliffs rise directly from the sea to elevations varying from 200 to 900 feet (61m0 to 274m3). The summits of Ganos dağları attain elevations of 2,985 feet (909m8) in Bakacak, about  $2\frac{1}{2}$  miles north-westward of Gaziköy, and of 2,810 feet (856m5) in Bakacak tepe (Yorlu Bakacak), about  $3\frac{1}{2}$  miles northward of the same point. This latter stretch of coast is steep-to with no good anchorage.

The town of Mürefte, situated about  $3\frac{1}{2}$  miles north-eastward of Eriklice burnu, is the seat of local government. Mürefte burnu, similar in character to Eriklice burnu, and fringed by a shoal bank extending a short distance offshore, lies about a quarter of a mile south-south-westward of the town. Mürefte burnu may be identified by some mills near its extremity.

In 1924, a shoal with a depth of 21 feet (6m4) on it, which has not been examined, was reported in a position about three-quarters of a mile south-south-westward of Mürefte burnu and about 6 cables offshore.

Anchorage with fair holding ground may be obtained south-eastward of the town of Mürefte ( $40^\circ 40' N.$ ,  $27^\circ 15' E.$ ), where a bank with depths of from 36 feet to 12 fathoms (11m0 to 21m9) is about 4 cables wide, but the extremity of Mürefte burnu should not be brought to bear less than

*Charts 1004, 2605.*

256° as the coastal bank is steep-to. This is the best anchorage off this part of the coast.

The town of Hoşkøy lies close westward of Hoşkøy burnu on the southern side of Hoşkøy (Kerasia) deresi, a deep ravine which descends from Doluca tepe. This ravine is normally dry but the heavy thunderstorms which occur in summer in this locality, and the rains in winter, convert it in a few hours into a roaring torrent. All the ravines in this neighbourhood are of this character.

A light is exhibited, at an elevation of 164 feet (50m0), from a white concrete tower and dwelling, 72 feet (21m9) in height, situated on a slight projection of the coast about three-quarters of a mile south-south-westward of Hoşkøy burnu.

There is fair anchorage off Hoşkøy in depths of about 12 fathoms (21m9), mud and sand, about half a mile offshore with the centre of the town bearing about 335°.

*Chart 2605.*

Gaziköy stands at a greater elevation than other towns on this coast, being mainly built on the steep slope of a spur of the hills about 100 feet (30m5) high, and is therefore prominent. Some ravines, which unite as they reach the coast close northward of the town have, when in flood, brought down and deposited a belt of sand and stones which, being bare, is a good mark from seaward. A monastery stands near the coast a short distance farther northward.

**Koca burnu to Tekirdağ.—Coast.**—From Koca burnu the coast trends north-eastward for about 8½ miles to the town of Tekirdağ. Kumbağ (Kum Baghu) köyü is situated about 1½ miles northward of Koca burnu; the high, cliffy coast ends here and thence as far as Tekirdağ, the coast is comparatively low with low cliffs in places.

Barbaros, a village around which are several mills, is situated on the coast on the northern side of a small stream about 2½ miles northward of Kumbağ köyü. This stream rises in Kainarji tepe, 1,050 feet (320m0) high, about 3½ miles north-westward of the village.

There is anchorage all along this stretch of coast but it is not good and the prevailing north-easterly winds make landing difficult. This is especially so between Barbaros and Tekirdağ where a rocky ledge fronts the beach.

*Charts 844, plan of Rodosto roads, 2605.*

**TEKIRDAG.**—Tekirdağ (Rodosto) (40° 58' N., 27° 31' E.) is an important commercial centre and is the administrative centre of the province. It had a population, in 1955, of 17,804. The town is built on the gentle slopes of a hill, facing southward, and from the bay appears very imposing; there are numerous trees interspersed among the buildings.

A group of houses with red roofs, conspicuous from seaward, is situated near the coast about 1½ miles south-south-westward of the town.

*Chart 844, plan of Rodosto roads.*

**Pier.—Light.—Anchorage.**—An L-shaped pier at which vessels not exceeding 320 feet (97m5) in length and 22 feet (6m7) draught, can berth, projects from the shore abreast the town; there is a depth of 26 feet (7m9) alongside the outer arm of this pier which is about 310 feet (94m3) in length. Water from springs and artesian wells is piped to the pier. There are three other small piers available for boats.

A light is exhibited from the elbow of the pier.

Tekirdağ roads is a fair anchorage but winds from east-south-eastward cause rather a heavy swell and landing is difficult even in a very light

*Chart 844, plan of Rodosto roads.*

breeze. The depths shoal gradually, there being depths of 30 feet (9m1) about 4 cables offshore.

The best anchorage berth is in depths of about 36 feet (11m0), sand, with a large, domed mosque, situated a short distance northward of the pier, bearing about 350°, distant about 6 cables. 5

**Regulations.**—Special regulations, copies of which may be obtained from the Harbour Authorities, are in force for the anchorage, berthing alongside the pier, and for vessels carrying inflammable or explosive cargo.

There are no pilots. Vessels arriving at night must anchor until about 0700 the following morning; arrangements for entering will then be communicated to them by a mooring launch. The berths are safe in winds from a northerly direction but with other winds, especially those from southward, a short steep sea soon arises and renders lying alongside the pier impossible. 10 15

Vessels must inform the harbour authorities of their expected arrival at least 24 hours beforehand; vessels carrying explosives must give three days notice of the precise date of arrival.

*Chart 2605.*

**TEKIRDAG TO LIMAN BURNU.—Coast.—Lights.—Anchorage.** 20

—From Tekirdağ the coast trends eastward for about 16 miles to Karga burnu. This stretch of coast is generally cliffy and within it the land gradually rises to elevations of from 500 to 600 feet (152m4 to 182m9); many streams discharge along it. The hills are rounded downs; either cultivated or covered with a yellow weed, and are destitute of trees; the valleys however, are for the most part wide and fertile. 25

Karga burnu is a projecting spur, 55 feet (16m8) high, at the eastern end of some low and earthy cliffs; foul, rocky ground, the outer edge of which is steep-to, extends for more than one cable off the point. Kokonar (Kurtnar) tepe, a conspicuous tumulus, 310 feet (95m4) high, rises about 1½ miles north-eastward of Karga burnu. 30

A conspicuous radio mast 643 feet (196m0) high, from which red obstruction lights are exhibited stands about half a mile west-north-westward of Karga burnu.

Örencik kayası (Venedik taşı) (40° 57' N., 27° 54' E.), a rock one foot (0m3) high, is situated on a rocky patch about one mile east-south-eastward of Karga burnu and about 4½ cables offshore. 35

A light is exhibited, at an elevation of 30 feet (9m1), from a concrete tower 16 feet (4m9) in height, situated on Örencik Kayası.

Between Karga burnu and Liman (Adar) burnu (Chart 2604) about 4 miles eastward, the coast consists mainly of sandy beaches backed by low, steep hills. A sunken rocky reef fringes this stretch of coast, extending about 2 cables offshore; between Liman burnu and Marmaraereğlisi, see below, about three quarters of a mile westward, the coast is cliffy and a flat ledge of rocks extends about 80 yards (73m2) offshore. Kum (Kumluca) dere flows into Kanlı liman about 2 miles westward of Liman burnu. 40 45

There is good anchorage off the whole stretch of coast between Tekirdağ and Karga burnu, the depths shoaling gradually from 20 fathoms (36m6) about 1½ miles offshore. The nature of the bottom varies, being sand, shells or muddy sand inshore and in the lesser depths, and mud in depths of 15 fathoms (267m4). 50

**Current.**—A countercurrent sets eastward along the coast between Tekirdağ and Karga burnu; it is almost inappreciable as is also the main current which sets westward farther offshore.

*Chart 2604, plan of Ereğli bay.*

- Ereğli liman.—Lights.—Buoy.—Anchorage.**—Ereğli (Erekli) liman is entered between Liman (Adar) burnu ( $40^{\circ} 58' N.$ ,  $27^{\circ} 58' E.$ ) and Ereğli (Erekli) burnu, about 8 cables north-north-eastward. Liman burnu is the extremity of a small hilly peninsula, 183 feet (55m8) high, on the northern slopes of which stands the town of Marmaraereğlisi (Erekli). When approaching along the coast from eastward or westward, this peninsula first appears as an island. Ereğli liman affords convenient anchorage over mud and sand in any winds except those from eastward, which raise a nasty short sea. The prevailing north-easterly winds of summer become easterly in this harbour and blow with considerable strength.

- A light is exhibited, at an elevation of 173 feet (52m7), from a white stone tower and dwelling, 26 feet (7m9) in height, situated about  $3\frac{1}{4}$  cables south-westward of Liman burnu.

- A light is exhibited, at an elevation of 20 feet (6m1), about three-quarters of a cable north-north-westward of Liman burnu.

- The remains of a mole extending about 2 cables north-westward from Liman burnu, still affords shelter from the swell to small craft in the southern part of the bay. A black, conical buoy marks the outer end of the remains of the mole.

A pier at the Customs house, about 3 cables westward of Liman burnu, has depths at its outer end of from about 9 to 12 feet (2m7 to 3m7).

- Small vessels may obtain anchorage in depths of 36 feet (11m0), with the extremity of Liman burnu bearing  $127^{\circ}$ , distant about  $2\frac{1}{4}$  cables. There is a convenient berth for larger vessels in depths of 48 feet (14m6), mud, with Liman burnu bearing  $168^{\circ}$ , distant  $3\frac{1}{4}$  cables.

*Chart 2604.*

- Ereğli burnu to Baba burnu.—Coast.—Anchorages.—Light.**—**Buoy.**—Between Ereğli burnu and Baba burnu, about 26 miles eastward, the coast is mainly low with sandy beaches and occasional cliffy points; shoal banks, on which are some sunken rocks, extend a short distance offshore in many places.

- Within this stretch of coast the land rises very gradually and is to all appearances without trees, arid and uncultivated. Seen from an offing, the skyline, which is formed by the summits of rounded downs about 700 feet (213m4) high, is about 5 miles inland. About 10 miles north-north-eastward of Ereğli burnu and near Çantaköy (Chanta kioi), is a moderately prominent flat-topped hill, 850 feet (259m1) high, on which Karaköy (Kara kioi) tepe and Çanta (Chanta) tepe, two large tumuli, stand out well against the skyline. About  $6\frac{1}{4}$  miles north-eastward of Selimpaşa (Boados), a village on the coast about 9 miles west-north-westward of Baba burnu, the mountains above Çatalca (Chatalja) rise to an elevation of 1,030 feet (313m9) and are the highest in this locality. There are many ancient tumuli in the neighbourhood, especially near the town of Marmaraereğlisi, some of which are prominent from certain directions at an offing.

- There is usually good landing on this stretch of coast, but the prevailing north-easterly winds of summer are here diverted to easterly and, when strong, raise sufficient surf on the beach westward of Silivri, *see below*, to make landing difficult except under the lee of the points; with southerly winds, landing is often dangerous.

- Silivri liman.—Anchorage.—Light.**—Silivri liman is entered between Karınca (Karga) burnu about 12 miles east-north-eastward of Ereğli burnu, and Kaba burun ( $41^{\circ} 03' N.$ ,  $28^{\circ} 16' E.$ ) about  $2\frac{1}{4}$  miles farther eastward. Foul ground extends about 2 cables from Karınca

*Chart 2604.*

burnu and a bank on which the depths are less than 18 feet (5m5) extends up to 3 cables from the shores of the bay.

The town of Silivri is situated on the eastern side of Silivri liman, about three-quarters of a mile north-westward of Kaba burnu; it stands on the slope of a hill rising in precipitous earth cliffs, 155 feet (47m2) in height, immediately eastward of the town. From seaward, these cliffs are prominent and ancient walls are visible on their summits.

The best anchorage in Silivri liman is on a line joining the entrance points, in depths of 48 feet (14m6), mud. Shelter is afforded to small craft by the remains of an old mole off the town.

A light is exhibited from the head of a concrete jetty abreast the town.

**Regulations.**—Special regulations are in force for vessels using the anchorage in Silivri liman, and for berthing alongside. Vessels must inform the harbour authorities of their expected arrival at least 24 hours beforehand.

**Coast.—Anchorage.**—The village of Selimpaşa (Boados) is situated on the coast about 5 miles eastward of Kaba burnu. There is a harbour here for small craft formed by an ancient Roman mole.

A rock with a depth of less than 6 feet (1m8) over it lies about one cable offshore abreast the centre of the village; it is marked by a buoy which is liable to drift during strong south-westerly winds.

Triklinos rock, situated about half a mile south-eastward of the old mole and about 2½ cables offshore, has a depth of 4 feet (1m2) over it; the inshore area between this rock and the village is rocky and foul.

A conical buoy, painted red and black in bands and surmounted by a ball is moored close southward of Triklinos rock.

Good anchorage may be obtained off Selimpaşa in depths of from 42 to 63 feet (12m8 to 16m5), with a tower in the village bearing 008°, but care must be taken not to proceed within depths of 30 feet (9m1) as the edge of the shorebank is steep-to.

Baba burnu, about 9 miles east-south-eastward of Selimpaşa, is cliffy and rises to a conical hill immediately within it. A bank on which the depths are less than 18 feet (5m5) and on which are several sunken rocks extends about 1½ cables from the point.

Anchorage may be obtained almost anywhere off the coast between Ereğli burnu and Baba burnu, in depths of from 48 feet to 12 fathoms (14m6 to 21m9), about half a mile offshore. The nature of the bottom changes from sand to mud in depths of over 60 feet (18m3).

**Submarine Exercise area.**—Submarine exercise frequently in the area, indicated on the chart, between Ereğli burnu and Baba burnu. A good lookout should be kept for them when passing through this area; see page 21.

For description of the coast farther eastward, see page 138, Chapter IV.

*Chart 1004.*

**WESTERN PART OF SOUTHERN SHORE OF MARMARA DENİZİ.** — **Eskifiner tepe to Inceburun.** — **Coast.** — **Dangers.** — **Anchorage.**—Eastward of Eskifiner tepe (Fanous hill) (40° 24' N., 26° 46' E.) (page 99), the southern or Asiatic shore of Marmara denizi is low; Bayram dere, draining a valley of the same name, flows into the sea about 4 cables eastward of the hill. On the eastern side of Bayram dere the hills approach the coast and terminate in cliffs about 220 feet (67m1) high. Farther eastward, the coast is alternately low or cliffy as far as Bozburun (Boz burnu), a point about 70 feet (21m3) high, situated about 6½ miles eastward of Eskifiner tepe. Within this latter stretch of coast,

*Chart 1004.*

the hills, which rise higher and higher inland, are moderately wooded.

There is a small pier a short distance northward of the mouth of Kara dere, about  $2\frac{1}{2}$  miles eastward of Eskifiner tepe.

- 5 Shoals with a least depth of 13 feet (4m1), rock and sand, over them, lie off the mouth of Kara dere between 2 and 4 cables offshore.

Bozburun bankı (Boz bank) with depths of 18 feet (5m5) over it, lies about one mile west-north-westward of Bozburun and about 6 cables offshore.

- 10 The summit of Akyalar dağı (page 96) on Gelibolu yarımadası, bearing  $264^\circ$  and open northward of the old lighthouse on Eskifiner tepe, leads northward of Bozburun bank, and the shoals off the mouth of Kara dere.

- Güres limanı is entered between Bozburun and Bodrum burnu, about 7 miles eastward. Bodrum burnu is a white rocky point about 25 feet  
15 (7m6) high, which projects north-westward from the general line of the coast and rises to a hill about 100 feet (30m5) high. Between Bozburun and the mouth of Değirmen (Deirmen) dere about one mile south-eastward, the coast is flat and sandy for some distance inland, but at the eastern end of this sandy stretch, hills rise in precipitous cliffs of varied  
20 heights separated by sandy coves. Viewed from seaward, wooded hills appear to rise in succession above one another with cultivated valleys between them. This character of the coast is maintained along the head of the bay as far as Kemer, a town on its north-eastern shore about 7 cables southward of Bodrum burnu. The town of Güres is situated about  
25  $1\frac{1}{2}$  miles inland in the fertile valley of Değirmen dere.

Kemer limanı, a bight at the north-eastern end of Güres limanı, is entered southward of Bodrum burnu and has a sandy beach. Kemer dere flows into the head of Kemer limanı; in winter the flat land around its mouth is generally under water.

- 30 This stream, which drains a large plain, never dries and for many miles is wide and deep, but in summer, a bar which dries forms across its mouth and the river water filters through this bar to the sea.

- The town of Kemer ( $40^\circ 25' N.$ ,  $27^\circ 04' E.$ ) stands on the shore of Kemer limanı under a high cliff which rises a short distance inland; a  
35 mosque stands on the beach in front of the town. A prominent mill is situated above the ruins of an ancient theatre near a point on the north-eastern shore of Kemer limanı, about  $2\frac{1}{2}$  cables south-eastward of Bodrum burnu; the partly-sunken remains of an old mole extend about one cable south-south-westward from this point.

- 40 There are no dangers in Güres limanı, the shore being generally steep-to with the exception of a few rocky islets close inshore in some places. Kemer limanı affords the only good anchorage, as elsewhere the prevailing north-easterly winds blow directly onto the shore and the holding ground is bad. Kemer limanı affords shelter from north-easterly winds in its  
45 inner part. Good anchorage may be obtained about  $2\frac{1}{2}$  cables offshore in depths of 12 fathoms (21m9), mud, with the extremity of Bodrum burnu bearing  $000^\circ$ .

- Between Bodrum burnu and Değirmencik adası, about 3 miles east-north-eastward, there are several sandy bights with rocky points between  
50 them. Değirmencik adası, an islet of marble, 120 feet (36m6) high, is connected with the mainland by a shoal ridge. A bank with depths of 30 feet (9m1) and less over it, extends about 2 cables north-north-eastward from the islet.

- Yumurta adası, an islet situated about 2 miles north-westward of  
55 Bodrum burnu and about  $2\frac{1}{2}$  cables offshore, is 125 feet (38m1) high and is composed entirely of marble, being whiter in appearance than

*Chart 1004.*

Değirmencik adası. Except for an 18-foot (5m5) shoal close southward of it, the islet is steep-to and there are depths of from 34 to 42 feet (10m4 to 12m8) between it and the coast of the mainland.

Anchorage, sheltered from easterly and south-easterly winds, may be obtained off Değirmencik iskelesi, about 4 cables westward of Değirmencik adası, in depths of 13 fathoms (23m8). This berth is situated north-north-westward of a small valley in which some mills at Değirmencik village, about three-quarters of a mile inland, are visible, with Aksaz burnu, *see* below, bearing about 089° and seen just southward of Değirmencik adası. 5 10

Between Değirmencik adası and Aksaz burnu, a bold and cliffy headland about 1½ miles eastward, the coast forms a bight with sandy beaches separated by cliffy points and is clear of dangers more than 2 cables offshore.

Şahmelek limanı is entered between Korkmaz (Korkmos) burnu, about one mile south-eastward of Aksaz burnu, and Şahmelek burnu, about 1½ miles farther eastward. Within this bay, the country is hilly and partly covered with brushwood. The village of Aksaz (Aksas) stands on Korkmaz burnu. A rock awash is charted about 2 cables south-westward of the eastern entrance point of the bay. 15 20

Anchorage may be obtained in Şahmelek limanı in depths of about 13 fathoms (23m8). There is sheltered landing in the eastern part of the bay but north-easterly winds raise a good deal of swell at the anchorage.

Between Şahmelek limanı and Inceburun (Ince burnu) (40° 28' N., 27° 17' E.) a very prominent headland about 6 miles east-north-eastward of Aksaz burnu, the coast is cliffy and steep-to. A few above-water rocks extend about half a cable north-eastward of Inceburun and are steep-to but the point is otherwise clear of dangers. 25

**Light.**—A light is exhibited, at an elevation of 177 feet (53m9), from a white concrete tower, 36 feet (11m0) in height, on Inceburun. 30

*Chart 224.*

**ERDEK KÖRFEZİ.**—**General remarks.**—Erdek körfezi (Gulf of Artaki) is formed on the west and south by the mainland between Inceburun and the base of Kapıdağı yarımadası; on the east by Kapıdağı yarımadası and on the north by Paşi Limanı adalar. The prevailing north-easterly winds make landing difficult. 35

Biga çayı (Biga Shehir chai) and Gönen çayı (Goenen dere), which flow into the gulf, are too much obstructed by shoals in summer even for boats to enter.

*Chart 1004.*

**Western side of Erdek körfezi.**—**Inceburun to Kale burnu.**—**Coast.**—Between Inceburun (40° 28' N., 27° 17' E.) and Kale burnu about 4½ miles south-south-eastward, the coast is high, cliffy and clear of dangers outside 2 cables offshore. 40

*Charts 844, plan of Karabuga bay; 906, 1004.*

Kale burnu is 55 feet (16m8) high and is the extremity of a promontory which forms the northern side of Karabiga limanı (Karabuga bay); except for some rocks awash which extend about 50 yards (45m7) off it, the point is free from dangers. 45

A light is exhibited, at an elevation of 75 feet (22m9) from a white metal tripod, 26 feet (7m9) in height, situated on Kale burnu. 50

*Chart 844, plan of Karabuga bay.*

**Karabiga limanı.** — **Dangers.** — **Quay.** — **Anchorage.** — Karabiga limanı is entered between Kale burnu and the mouth of Biga çayı about 2½ miles southward. Westward and southward of the southern side of the 55



*Charts 844, plan of Karabiga bay.*

- promontory terminating in Kale burnu which consists of a low cliff, the shore of the bay is nearly all sandy beach. Cal (Chal) tepe, a rounded hill with a double summit, 265 feet (80m8) high is situated about 2 miles  
 5 west-south-westward of Kale burnu having a narrow strip of flat ground between its foot and the sea; it stands on the northern edge of the great plain of Biga çayı.

- Within Kale burnu are the remains of some fine Byzantine walls, the ruined towers on which are prominent from seaward. The remains of an  
 10 ancient mole, nearly awash, are situated about 2 cables westward of Kale burnu.

- The town of Karabiga (Karabuga) is situated at the north-western corner of the bay about  $1\frac{1}{2}$  miles westward of Kara burnu and about a quarter of a mile inland. On the beach south-eastward of the village are  
 15 some houses and a pier with a depth of about 8 feet (2m4) alongside its head. Karabiga is the port of Biga which is situated about 13 miles south-westward on the banks of Biga çayı.

A quay, with a depth of about 12 feet (3m7) at its head is situated 3 cables east-north-eastward of the summit of Cal tepe.

- 20 A bank of rock and sand on which the depths are less than 18 feet (5m5) fringes the head of the bay and extends as much as 2 cables south-south-eastward from a low, cliffy point about 3 cables east-north-eastward of the pierhead; a rock, 3 feet (0m9) high, lies on this bank about half a cable south-eastward of the low, cliffy point.

- 25 A 15-foot (4m6) patch lies about 2 cables eastward of the pierhead.

- Anchorage with good holding ground may be obtained anywhere in Karabiga limanı but the bay is open north-eastward and eastward. There is, however, a little shelter to be obtained by anchoring in the north-western corner of the bay, in depths of 36 feet (11m0), with the ruined  
 30 towers on Kale burnu promontory ( $40^{\circ} 24' N.$ ,  $27^{\circ} 20' E.$ ) bearing  $040^{\circ}$ , and the 3-foot (0m9) rock bearing  $275^{\circ}$ . North-easterly gales in Erdek körfezi are generally from about north-north-east but draw more easterly locally in Karabiga limanı and do not bring in sufficient swell to endanger vessels.

- 35 If it is desired to get as close as possible to the town, the houses on the beach fronting the town should be brought to bear  $302^{\circ}$ , and the vessel anchored in a convenient depth on that bearing, which leads southward of the projection of the shorebank.

- In smoother weather, boats can be beached on the sand in the western  
 40 part of the bay as there are depths of 6 feet (1m8) close to the beach. During strong north-easterly winds, landing can be effected a short distance westward of the ruins on the Kale burnu promontory.

- Harbour Limits.**—The harbour area, comprising the outer and inner harbours, lies northward of a line drawn eastward from Cal tepe  
 45 (see above), and westward of a line drawn southward from Kale burnu; the inner harbour lies in the north-western corner of the harbour area, with its southern limit  $2\frac{1}{2}$  cables southward of the pier.

- Regulations.**—Special regulations, copies of which should be obtained by vessels proceeding to Karabiga, are in force for anchoring, berthing  
 50 alongside the mole, and for vessels carrying inflammable or explosive cargo. Vessels are required to give the harbour authorities at least 24 hours notice in advance of the date and time of arrival, nationality, cargo, and last port of call; vessels laden with explosives must give 3 days prior notice. Unless prevented by important reasons, masters of all vessels must present  
 55 their papers to the Harbour Directorate within one hour of arrival.

Vessels carrying inflammable or explosive cargo are required to anchor

*Chart 844, plan of Karabuga bay.*

in the outer harbour, southward and eastward of the southern limit of the inner harbour.

*Chart 906.*

**Southern side of Erdek körfezi.—Anchorage.**—Between Karabiga 5 village and Misakça (Musacha), a village on the coast about 18 miles east-south-eastward, the southern shore of the gulf is low, the hills rising some distance within it; farther eastward, it is clifty and steep. Karakuşluk (Mal Dere) burnu ( $40^{\circ} 19' N.$ ,  $27^{\circ} 43' E.$ ) is a bold, clifty point about 10 2 miles eastward of Misakça.

Biga çayı (Biga Shehir chai), the ancient *Granicus*, discharges a large volume of water into the gulf in winter and spring, but in summer its mouth is almost closed by a bar over which there is a depth of only a few inches; above the bar, boats can ascend for 2 or 3 miles.

Gönen (Goenen) çayı, the ancient *Aesepus*, enters the gulf about 15  $13\frac{1}{2}$  miles eastward of the mouth of Biga çayı. Unlike the latter river, its delta has extended into the gulf and formed an extensive bank off the coast. The actual mouth has evidently varied much, as several lagoons, which are now quite unconnected with the river, show unmistakable signs of having once been branches of it. 20

A bank on which the depths are less than 18 feet (5m5) extends up to one mile offshore on the western side, and about 6 cables offshore on the eastern side of the delta; this bank is very steep-to and caution is necessary when approaching it with a view to anchoring.

Anchorage can be obtained anywhere off this stretch of coast between 25 about half a mile and  $1\frac{1}{2}$  miles offshore, in depths of from 42 feet to 15 fathoms (12m8 to 27m4), sand, changing to mud in the greater depths.

*Charts 884, 906.*

**ERDEK LIMANI.—Port Limits.—General remarks.—Submarine 30 cable.**—The port of Erdek is defined as all the waters eastward of a line joining Kavaklıdere, or Ocaklar burnu (Korakhia burnu) situated about 7 miles northward of Karakuşluk burnu, and Topçu (Topchu) burnu ( $40^{\circ} 20' N.$ ,  $27^{\circ} 48' E.$ ). The Inner harbour comprises the area eastward of a line joining the western extremity of Muratbayırı burnu (see below) 35 and the south-western point of Zeytinliada (Zeitini ada), the remainder is known as the Outer harbour.

The north-eastern side of Erdek limanı is formed by the south-western coast of Kapıdağ yarımadası between Kavaklıdere burnu and Muratbayırı burnu the western point of Seyitgazi tepe which rises to an elevation of 40 340 feet (103m6) about  $3\frac{1}{2}$  miles south-eastward. Kavaklıdere burnu is clifty and rises steeply to Fener tepe (Pinar tepe), 564 feet (172m0) high. Between Kavaklıdere burnu and the town of Erdek about 3 miles south-eastward, the coast is low and sandy with a plain between it and the foot of the hills inland. Erdek is the seat of local government and contains 45 several mosques with tall and prominent minarets.

Zeytinliada is a rocky islet, 45 feet (13m7) high lying about  $1\frac{1}{2}$  cables offshore south-westward of the town of Erdek, there is a channel about three-quarters of a cable wide with a depth of 12 feet (3m7) between the islet and the mainland. Ada bankı over which there is a depth of 19 feet 50 (5m8) lies about  $2\frac{1}{2}$  cables south-westward of Zeytinliada ( $40^{\circ} 24' N.$ ,  $27^{\circ} 48' E.$ ).

A submarine power cable and a water pipe are laid from the northern end of Zeytinliada in a north-north-easterly direction to the shore.

Seyitgazi tepe has a curious crust of marble overlaying other rock and 55

*Charts 884, 906.*

risers to a prominent summit. The remains of ancient fortifications still exist on the north-eastern side of this headland.

- Tavşan adası (Towshan ada), a barren, rocky islet, 150 feet (45m7) high, lies about  $4\frac{1}{2}$  cables south-westward of Seyitgazi tepe, being separated from it by Seyitgazi geçiti (Simeon channel). Murat bankı, a 23-foot (7m0) rocky patch lies about  $1\frac{1}{2}$  cables south-westward of the south-western extremity of Seyitgazi tepe; vessels using Seyitgazi geçiti should therefore hug the island side which is steep-to and clear of dangers.

- Cinarlı limanı is contained between the eastern point of Seyitgazi tepe and a point about 3 cables north-eastward. A naval base is situated in the bay and anchorage in the bay is reserved for vessels of the Turkish Navy.

- The head of Erdek limanı lies on the western side of the isthmus connecting Kapıdağ yarımadası with the mainland and is entered between Topçu burnu, about  $4\frac{1}{2}$  miles east-north-eastward of Karakuşluk burnu (page 111) and Seyitgazi tepe.

- The land on both sides of the gulf is high. On the southern side the hills rise close within the coast, but on the northern side there is a cultivated plain between the foot of the mountains and the sea. Some ruins stand on this plain near the head of the gulf.

The isthmus is mainly swampy on its western side, but on its eastern side there are some low, bare sandhills.

- The town of Edincik (Adinjik) ( $40^{\circ} 21' N.$ ,  $27^{\circ} 52' E.$ ) lies in a dip between the hills on the southern side of the head of the gulf, about  $2\frac{1}{2}$  miles east-north-eastward of Topçu burnu and about 6 cables inland.

- Oil pipeline.—Mooring buoys.**—An oil pipeline extends north-north-westward from the shore for just over half a cable, from a position about  $1\frac{1}{2}$  cables north-westward of the small pier at Edincik iskelesi. Some oil tanks stand at the root of the pipeline. Two mooring buoys lie close north-north-westward and about three-quarters of a cable westward of the head of the pipeline.

- Prominent objects.**—The following objects near the shores of the head of the gulf are good marks from seaward:—The north-western minaret in Edincik and two windmills, situated close together on the summit of a hill 850 feet (259m1) high, about half a mile east-north-eastward of it; a white square building with a red roof, situated at the root of a small pier at Edincik (Adinjik) iskelesi, about  $1\frac{1}{2}$  miles north-north-eastward of the town; the largest cypress tree; situated about one mile north-north-eastward of Edincik iskelesi; and a stone tower, situated a short distance eastward of a ruined amphitheatre, about one mile north-north-eastward of the cypress tree.

- Anchorage.**—The head of Erdik limanı affords capacious anchorage and is calm in all except south-westerly winds. The holding ground is good everywhere, especially in the greater depths of the north-western part. South-westerly gales are rare in winter, but when they do occur, are heavy.

There is good anchorage in the Inner harbour. A good berth in depths of 60 feet (18m3) may be obtained with the south-western extremity of Zeytinliada bearing  $306^{\circ}$ , distant  $1\frac{1}{2}$  cables. There is a pier at Erdek ( $40^{\circ} 24' N.$ ,  $27^{\circ} 48' E.$ ).

- Explosives anchorage.**—Vessels carrying explosives or inflammable cargoes are required to anchor in the south-eastern portion of Erdek limanı.

**Regulations.**—Vessels should give 24 hours notice of their expected time of arrival.

- Special regulations are in force, similar to those for Karabiga (page 110), and should be obtained from the Port Authority.

## Chart 2242.

**PAŞA LIMANI ADALAR.**—General remarks.—Paşa Limanı adalar consist of four islands and some islets lying westward of Kapıdağ yarım-adası. The surfaces of all of them are very broken and their shores are rocky except at the heads of some small bays where there are sandy beaches. 5

Paşalimanı adası, the largest and easternmost of these islands, possesses a good harbour and is cultivated. The remaining islands are only partly cultivated and are otherwise covered with grass or scanty bush.

Ekinlik (Kutali) roads, between Ekinlik (Ekinik) adası, the north-western island, and Avşar (Arablar) adası, south-eastward of it, is a good anchorage in northerly winds. 10

**Ekinlik adası.**—Dangers.—Ekinlik adası lies with Ortaavlu burnu (Kalolimionos point) ( $40^{\circ} 32' N.$ ,  $27^{\circ} 28' E.$ ) its south-western extremity, about 9 miles east-north-eastward of Inceburun (page 109). Its coasts are rocky and cliffy. The summit of the island, which has rounded sides and a flat top, rises near the western end to an elevation of 500 feet (152m); the central and eastern parts of the island are much lower. Ekinlik (Kutali) village is situated about midway along the southern coast of the island. 15

Foul ground extends about  $1\frac{1}{2}$  cables southward from Ortaavlu burnu and a shoal with a least depth of 24 feet (7m3) over it lies about half a mile east-south-eastward of the same point. 20

A shoal with a least depth of 13 feet (4m1) over it lies between 2 and 5 cables offshore south-eastward of Ekinlik village.

Hudro Plaka ledge, a sunken rocky ledge over which the current makes a ripple, extends about 2 cables east-south-eastward from Saint Triada burnu, the eastern extremity of the island. 25

**Ekinlik geçiti.**—Current.—Ekinlik geçiti (channel), between Ekinlik adası and Avşar adası, is about three-quarters of a mile wide at its narrowest part. The eastern part of the channel is obstructed by a bar over which there are depths of 24 feet (7m3) in the fairway. The channel is narrowed to a width of about half a mile by banks which, with depths of less than 18 feet (5m5) over them, extend from either side. The current sets westward, towards Ekinlik adası; an eddy or countercurrent has been observed to set at a rate of  $1\frac{1}{2}$  knots. 30 35

**Anchorage.**—Anchorage can be obtained in Ekinlik (Kutali) roads in depths of from 36 to 60 feet (11m0 to 18m3), sand and mud, southward of Ekinlik village and westward of the 13-foot (4m1) shoal mentioned above. The best berth is in depths of 48 feet (14m6), with a mill near the western end of the village bearing  $332^{\circ}$ , and a red-roofed mill on a point immediately eastward of the village, bearing  $042^{\circ}$  and in line with a 170-foot (51m8) hill near the northern extremity of Ekinlik adası. There is a slight swell at the anchorage during strong north-easterly winds but not sufficient to affect a well-found vessel. In south-westerly gales Ekinlik roads affords no protection and, in these conditions, vessels should make use of Paşa Limanı harbour (page 115). 40 45

**Avşar adası.**—Dangers.—Light.—Avşar (Arablar) adası lies with Ekinlik burnu (Voli point) ( $40^{\circ} 32' N.$ ,  $27^{\circ} 31' E.$ ), its northern extremity, about three-quarters of a mile south-eastward of Saint Triada burnu. Its surface is broken and its hills are craggy and bare. Yığıtler köyü (Arablar), a village which, in 1931, was half in ruins, lies on the eastern coast, and the village of Türkeli (Afisia) lies on the western coast of the island. 50

Avşar adası has no harbour and, although some shelter from north-easterly winds may be found off Türkeli, better and more convenient anchorage can be obtained in Ekinlik road. 55

The coasts of Avşar adası are mostly rocky, and foul ground extends

*Chart 2242.*

from about half a cable to  $1\frac{1}{2}$  cables offshore in several places. Between Ekinlik burnu and the village of Türkeli, about 2 miles south-south-westward, a bank on which the depths are 18 feet (5m5) and less  
5 extends up to 4 cables offshore.

Hayırsızada (Roun rock), 20 feet (6m1) high, lies in the southern approach to Ekinlik geçiti, about 9 cables west-north-westward of Türkeli; it is connected with the coast northward of the village by a bank on which the depths are less than 60 feet (18m3). This rock is  
10 surrounded by a sunken rocky flat which extends about 2 cables north-eastward and half a cable north-westward from it. A 24-foot (7m3) rocky patch lies about  $3\frac{1}{2}$  cables east-north-eastward from the rock.

A light exhibited, at an elevation of 59 feet (18m0) from a white concrete tower, 33 feet (10m1) in height, situated on Hayırsızada ( $40^{\circ} 31' N.$ ,  
15  $27^{\circ} 29' E.$ ).

A shoal spit on which there is a rock about 15 feet (4m6) high, extends about  $1\frac{1}{2}$  cables north-eastward from a point about midway between Ekinlik burnu and Marmara burnu, the north-eastern extremity of the island, about 2 miles east-south-eastward of Ekinlik burnu. Off this spit  
20 and about  $4\frac{1}{2}$  cables north-eastward of the point, is a detached 24-foot (7m3) rocky patch.

**Araplar geçiti.**—Araplar geçiti (Arablar channel), between Avşar adası westward, and Paşalimani adası and Koyun (Kuyus) adası eastward, is about one mile wide at its narrowest point and is clear of dangers. The  
25 northern entrance points of the channel are steep-to but depths of less than 30 feet (9m1) extend about 2 cables off Büyükliman burnu (Yalıpliman point), and a similar distance from the south-western extremity of Koyun adası.

**Submarine cable.**—A submarine cable is laid across Araplar geçiti  
30 between Büyükliman burnu on Avşar adası, and Incirclı (Glaromiti) burnu on Paşalimani adası; see page 27.

**Paşalimani adası.**—**Islets and rocks.**—**Light.**—Paşalimani (Pasha Liman) adası is separated from the western end of Kapıdağ yarımadası by Narlıköy geçiti (Rhoda channel) (page 116). The surface of the island is  
35 varied, the hills being mostly rounded. Kukumav tepe (Mount Elias) a symmetrical cone, 700 feet (213m4) high, is situated near the northern extremity of the island. It is the highest hill in Paşa Limanı adalar and is a prominent mark from all directions. The south-eastern part of the island, on which is the village of Tuzla (Hukhlia) is a peninsula which is  
40 connected with the main part by a low, narrow isthmus. There are a few trees on the island. There are several villages of which Paşa Limanı (Pasha Liman), on the western coast, contains the residence of the governor of the group.

A light is exhibited, at an elevation of 72 feet (21m9), from a white frame-work tower on a concrete base, 23 feet (7m0) in height, on the eastern  
45 extremity of Paşalimani adası, about 3 cables eastward of Tuzla village.

Anchorage may be obtained in any of the bays, but the holding ground is poor, except in Paşa Limanı harbour.

*Chart 2242, with plan of Pasha Liman harbour.*

Yerada (Panagia) ( $40^{\circ} 28' N.$ ,  $27^{\circ} 34' E.$ ), an islet, 115 feet (35m0) high, with a smooth, grassy summit, is situated about 4 cables west-north-westward of Mermer burnu (Argero point), the south-western extremity of Paşalimani adası. It is almost surrounded by a bank which, with depths  
50 of less than 18 feet (5m5), extends as much as  $1\frac{1}{2}$  cables offshore in places;  
55 its western extremity is steep-to. A shoal ridge on which there are above-

*Chart 2242, with plan of Pasha Liman harbour.*

water and sunken rocks, connects this islet with Pala adası, an islet, 30 feet (9m1) high, about 3 cables farther southward.

The channel between Yerada and Paşalimanı adası has a least depth of 42 feet (12m8) in the fairway; banks on which the depths are less than 18 feet (5m5) extend about three-quarters of a cable from either side. 5

Koyun (Kuyus) adası, a narrow, grass-covered island which forms the western side of Paşa Limanı harbour, is separated from İncirli burnu (Glaromiti point), a point on the western side of Paşa Limanı adası about 1½ miles northward of Mermer burnu, by Geçit Topuğu (West pass), which is about 7 cables wide. Koyun adası rises in rounded hillocks to elevations of 295 feet (89m9) near its southern end, and of 415 feet (126m5) near its northern extremity; the former hill is covered with large white boulders. 10

Mamaliada (Mamalia), 130 feet (39m6) high, is separated from the northern extremity of Koyun adası by a shallow and narrow opening. 15

Koyun adası and Mamaliada are both fringed by a narrow, sunken, and rocky ledge which, with depths of less than 18 feet (5m5), extends about 3 cables southward, and about 4 cables eastward from the southern end of the former island. Hacı adaları (Centre islands), two flat-topped islets the southern and larger of which is 50 feet (15m2) high, lie on the eastern edge of this bank. There are many patches with less than 6 feet (1m8) over them on this bank; its edge is steep-to and is generally visible. 20

**Paşa Limanı harbour.—Dangers.—Buoys.**—Paşa Limanı (Pasha Liman) harbour, on the north-western side of Paşalimanı adası, is sheltered from all winds and affords anchorage for several large vessels in its southern part, in depths of from about 48 feet to 12 fathoms (14m6 to 21m9), mud and good holding ground. 25

İncirli burnu, on the southern side of Geçit Topuğu, *see above*, is encumbered by Fairway patch which, with a least depth of 18 feet (5m5), rock, lies close within the entrance about midway between İncirli burnu and the southern Hacı adası. The patch is generally not discernible. The straighter channel lies southward of Fairway patch and a depth of 42 feet (12m8) can be carried on the leading line, *see Directions below*. 30

Ortalik bankı (Middle ground), with a least depth of 9 feet (2m7), lies between 4 and 5 cables east-north-eastward of İncirli burnu and affords some protection to the southern part of the harbour from the swell which enters Geçit Topuğu during south-westerly gales. This shoal is not visible and care must be taken to avoid it when picking up a berth. 35

Kablo burnu (Cape Kukumar) (40° 31' N., 27° 36' E.) the north-western extremity of Paşalimanı adası and the eastern point of the northern entrance to the harbour, is a bold headland from which a sunken rocky ledge extends about 1½ cables south-westward. 40

**Submarine telegraph cable.**—A submarine telegraph cable, the position of which is indicated on the chart, connects Kablo burnu with Marmara adası, *see page 27*. 45

**Directions.**—Vessels entering the harbour through Geçit Topuğu should approach with a tall house near the north-western end of Paşa Limanı village bearing 079° and in line with a ruined mill on a ridge behind the village, *see view on chart 2242*. This will lead midway between Fairway patch and the bank fringing İncirli burnu and northward of Ortalik bankı when the northern Hacı adası is open eastward of the southern islet, course may be shaped as convenient for an anchorage. 50

In consequence of the construction of several houses northward of the village, this leading line may be difficult to distinguish. 55

The northern entrance is clear of dangers except for the rocky ledge off

*Charts 2242, plan of Pasha Liman harbour.*

- Kablo burnu. Vessels using this entrance should approach with Kayalı tepe (West peak), a well-defined hill, 380 feet (115m8) high, situated about 9 cables southward of İncirli burnu, bearing  $197^{\circ}$  and in line with the eastern extremity of the southern Hacı adası. This will lead in mid-channel through the entrance and when Kablo burnu bears  $077^{\circ}$ , course should be altered to about  $171^{\circ}$  and thence as convenient for the anchorage.

*Charts 2242, 906.*

- 10 **NARLIKÖY GEÇİTİ.—Lights.—Submarine telegraph cable.**—Narlıköy geçiti (Rhoda channel) between Paşalimanı adası and the western end of Kapıdağ yarımadası, affords access to Erdek körfezi from northward. It is clear of dangers except for a bank off Mutha burnu, *see* below. In 1920, the depths in the northern part of the channel were reported to be less than those charted.

- 15 Konya liman (Gonia bay) is entered between Kavaklıdere burnu (Karakaya burnu) page 111, and Büyükmaymun burnu (Cape Karithia), about 2 miles north-westward. The shores of the bay rise steeply to Yataklarbası tepe (Mount Klapsı), 2,530 feet (771m1) high. The small village of Ocaklar köyü (Gonia) is situated at the south-eastern corner of the bay with a small area of flat land around it.

*Chart 2242.*

- From Büyükmaymun burnu to Narlıköy (Mutha) burnu, about  $1\frac{1}{2}$  miles north-westward, the mountains slope gradually down to the coast. Narlıköy burnu is a low, sandy point difficult to distinguish at night, off which a sandy flat with depths of less than 30 feet (9m1) extends about 2 cables. About one cable east-south-eastward of Narlıköy burnu is Narlıköy village (Rhoda village).

- 30 Balyozfener burnu (Palios point) is a bold cliffy headland about 100 feet (30m5) high, situated about  $1\frac{1}{2}$  miles northward of Narlıköy burnu.

A light is exhibited at an elevation of 125 feet (38m1), from a white metal framework tower and dwelling, 39 feet (11m9) in height, situated on Balyozfener burnu ( $40^{\circ} 30' N.$ ,  $27^{\circ} 41' E.$ ).

For the light on the western side of Narlıköy geçiti, *see* page 114.

- 35 A submarine telegraph cable, the position of which is indicated on the chart, crosses Narlıköy geçiti in a westerly direction between Balyozfener burnu and the eastern coast of Paşalimanı adası.

- İlhanköy Fener burnu (Harakhi point), a bold, high point which forms the north-western extremity of Kapıdağ yarımadası, is situated about half a mile northward of Balyozfener burnu. A rocky flat on which the depths are less than 18 feet (5m5) extends about one cable westward from the point, and a rock, 10 feet (3m0) high, stands on a rocky spit extending about  $1\frac{1}{2}$  cables offshore from a position about one cable eastward of İlhanköy fener burnu.

- 45 **Anchorage.**—Anchorage may be obtained anywhere in Narlıköy geçiti clear of the telegraph cable but by far the best anchorage is southward of Balyozfener, well sheltered from north-eastward and in which the holding ground is good. The best berth is in depths of about 13 fathoms (23m8), clear of the telegraph cable.

- 50 Anchorage can be obtained in Konya liman in depths of from 48 feet to 17 fathoms (14m6 to 31m1), but with north-easterly winds, heavy squalls occasionally blow down the ravines even when there is only a moderate breeze on the northern side of Kapıdağ yarımadası.

- There is fair anchorage southward of Narlıköy (Rhoda) village in 55 depths of about 16 fathoms (29m3).

*Chart 2242.*

**Current.**—The current has been observed to set southward through Narlıköy geçiti at a maximum rate of  $2\frac{1}{2}$  knots. See page 45.

**MARMARA ADASI.**—**Aspect.**—Marmara adası lies about 5 miles north-westward of Kapıdağ yarımadası. The island is 10 miles long and is mountainous throughout, a double range extending across it in an easterly and westerly direction. It is divided geologically into two distinct portions. The northern portion, northward of a line joining Çınarlı (Galimi), a village about midway along the western coast, with Beyazburun (Beyaz point) ( $40^{\circ} 38' N.$ ,  $27^{\circ} 45' E.$ ), the eastern extremity of the island, is composed of white marble with scarcely any soil on it. The valleys in this part have steep sides devoid of vegetation or cultivation which is confined to their bottoms. That part of the island southward of this line is composed of slaty rock with occasional patches of granite, and the valleys and lower slopes are well cultivated. The mountains of the southern part, which are higher than those in the northern part, are craggy and attain their greatest elevation of 2,307 feet (699m0) in Büyükçayır tepe (Psili dagh), about  $2\frac{1}{2}$  miles eastward of Çınarlı; the summit of this mountain is a long ridge which shows as a peak only when seen from north-eastward or south-westward.

The celebrated marble quarries are in the north-eastern part of the island where the debris from them has formed a steep white slope on the shores of Memercik limanı (Memerjik bay), a bight on the northern coast about 3 miles west-north-westward of Beyazburun; this white patch is very prominent from northward.

The principal village, Marmara, is situated on the coast at the south-western end of the island, about 2 miles south-south-eastward of Çınarlı; Turkish officials reside in this village. Adataş (Batizona), an islet 25 feet (7m6) high, is charted about 2 cables north-westward of Malama burnu (Melima point) ( $40^{\circ} 36' N.$ ,  $27^{\circ} 32' E.$ ), which is situated about  $1\frac{1}{2}$  miles north-westward of the village of Marmara.

**Off-lying island.**—**Light.**—**Fog signal.**—Hayırsızada (Khairsiz), a barren islet of a grey colour, 330 feet (100m6) high, is situated westward of Çamaltı burnu, the north-western extremity of Marmara adası, from which it is separated by a channel about  $1\frac{1}{2}$  miles wide.

A light is exhibited, at an elevation of 366 feet (111m5), from a metal framework tower, 26 feet (7m9) in height, situated on the northern summit of Hayırsızada. A fog signal is sounded from a position near the lighthouse. *Chart 844, plan of Palatia and Mermerjik bays.*

**North-eastern side of Marmara adası.**—**Anchorage.**—Saraylar limanı (Palatia bay) is situated on the north-eastern coast of Marmara adası, about 4 miles west-north-westward of Beyazburun and in the neighbourhood of the marble quarries. North-easterly winds blow home in the bay but there is sheltered anchorage in the eastern part, in depths of from 30 to 60 feet (9m1 to 11m0), with the western extremity of the eastern entrance point bearing about  $015^{\circ}$ , and the northern end of a long sandy beach bearing  $093^{\circ}$ . The village of Saraylar (Palatia) is situated at the head of the bay.

Memercik limanı (Memerjik bay), entered immediately eastward of Saraylar limanı, is entirely open north-eastward. It is separated from Saraylar by a peninsula which rises to an elevation of 210 feet (64m0). Işek adası (Nisi) an island 125 feet (38m1) high, with some surrounding rocks and islets, the outer of which is Kayainönü adası, lies on the western side of Memercik limanı and is clifty and bare. A channel about one cable wide, and suitable only for small craft, separates Işek adası from the coast westward.



*Chart 2242.*

**Off-lying island.—Light.**—Asmalıada (Fanar adası), a marble islet situated about 6 cables eastward of Beyazburun, is 100 feet (30m5) high and steep-to on all sides except the western, where a sunken ledge on 5 which are some rocks awash extends about 2 cables offshore.

A light is exhibited, at an elevation of 131 feet (39m9), from a white metal framework tower and dwelling 30 feet (9m1) in height, situated on Asmalıada (40° 38' N., 27° 46' E.).

**MARMARA BOĞAZI.—Submarine telegraph cable.**—Marmara 10 adası divides Marmara denizi into two channels. The northern channel, between the island and the European shore, is about 10 miles wide and free from dangers, and is used by nearly all vessels bound to the Bosphorus during the finer part of the year.

The southern channel, known as Marmara boğazı (channel), between 15 Marmara adası and Paşa Limanı adalar, is about 3 miles wide at its narrowest part and is nearly as clear as the northern channel. There are also good anchorages off its shores in case of bad weather, but the west-going current runs with a much greater strength southward of Marmara adası, and with north-easterly winds the wider northern channel is to be 20 preferred.

In clear weather, Marmara boğazı is useful as an alternative route when bound westward from İstanbul to the Dardanelles, as by adopting it, vessels coming in the opposite direction through the northern channel are avoided. The light on Asmalıada is a good guide for entering the 25 channel, and the southern points of Marmara adası are bold and easily seen at night.

A light is exhibited, at an elevation of 49 feet (14m9) from a white metal tower 20 feet (6m1) in height, situated on Aba burnu (Palios Pyrgos point) (40° 35' N., 27° 35' E.), the western entrance point of Beyaz liman 30 about three-quarters of a mile south-eastward of Marmara village.

A submarine telegraph cable, the position of which is indicated on the chart, crosses Marmara boğazı in the south-south-westerly direction between Beyaz liman, situated about 2 cables south-eastward of Gündoğu Prastio) village (40° 35' N., 27° 36' E.), and Kablo burnu (Cape 35 Kupumar) the north-western extremity of Paşalimanı adası.

A conspicuous white minaret stands in the northern part of Gündoğu village.

**Dangers.**—Laz Kayası (Laza rock), a small rock with a depth of 9 feet (2m7) over it, lies about 4 cables southward of the eastern entrance point 40 of Kızak limanı (Klazati bay), on the south-eastern side of Marmara adası, about 3½ miles west-south-westward of Beyazburun. Any part of Ekinlik adası (page 113), open southward of the southern coast of Marmara adası, leads southward of this rock.

A conspicuous minaret is situated about a quarter of a mile inland 45 from the head of Kızak limanı (40° 36' N., 27° 40' E.).

For dangers off the northern coast of Avşar adası, see page 113.

**Anchorage.**—Anchorage may be obtained in any of the small bays on the southern coast of Marmara adası, but during northerly winds, heavy squalls which vary considerably in direction come off the land, and in 50 general, the coast is steep-to with little room for anchorage; this applies especially to the anchorage off Marmara village which is backed by high and precipitous mountains.

The best anchorage off the southern coast of Marmara adası is in the eastern part of Kızak limanı, in depths of about 15 fathoms (27m4). 55 Care should be taken to avoid Laz Kayası.

*Chart 2242.*

For anchorages in Paşa Limanı adalar, *see* pages 113–116, and for those off Kapıdağ yarımadası, *see* below.

*Chart 224.*

**KAPIDAĞ YARIMADASI.—General remarks.**—Kapıdağ (Kapu dağ) yarımadası is a mountainous mass, joined to the mainland by a low isthmus about one mile wide. The western side of the isthmus is formed by the shore at the head of Erdek limanı, and the eastern side by the shore at the head of Bandırma (Peramo) körfezi.

The higher mountains, which culminate in the sharp peak of Adamkaya tepe, 2,595 feet (791m) high, are covered on their northern sides with low oak trees, and are the source of many streams which never fail in supplying water to the numerous cultivated spots in the lower parts of the valleys, which are all fertile. Villages are scattered round the shores of the peninsula.

The south-western side of Kapıdağ yarımadası is described under Erdek limanı on pages 111 to 112 and Narlıköy geçiti on page 116.

*Chart 2242.*

**Northern side of Kapıdağ yarımadası.—Dangers.—Anchorages.—Light.**—Between İlhanlı Fener (Harakhi) burnu (page 116) and a position abreast Fatih adası (Halko), an islet, 120 feet (36m) high, about 1½ miles north-eastward and about 2 cables offshore, the coast is fringed by a bank which, with depths of less than 18 feet (5m) and several above-water and sunken rocks on it, extends as much as 2 cables offshore. Likos rock, with a depth of 4 feet (1m) over it, lies near the outer edge of this bank about one mile north-eastward of İlhanlı Fener burnu. Shoals extend about one cable from Likos rock and the latter is generally not discernible. The summit of the peninsula forming the south-eastern end of Paşalimanı adası, bearing about 200° and in line with İlhanlı Fener burnu, leads westward of Likos rock.

There are several above-water rocks around Fatih adası and the channel between it and the mainland is obstructed by 12-foot (3m) patches.

Fatimi liman, a bight about one mile eastward of Fatih adası, is too open north-eastward to afford good anchorage; its eastern side is foul. Obüs limanı (Drakontas bay), immediately eastward of Fatimi liman, and separated from it by a narrow mountain spur, is the best anchorage on the northern coast of Kapıdağ Yarımadası. It is open northward, but some shelter from north-easterly winds may be obtained on its eastern side in depths of 13 fathoms (23m), mud, with the eastern entrance point of the bay bearing 012° and a few houses at its south-eastern corner bearing 115°. Doğanlar (Drakontas) village is situated in a valley about three-quarters of a mile within the head of the bay; the lower part of this valley is cultivated.

*Chart 907.*

Fatih (Vathi) limanı, about 2 miles eastward of Obüs limanı, is also open northward; Turanköy (Vathi) village is situated on the south-western shore of the bay. The sides of the bay are steep-to with no off-lying dangers, and rise precipitously from the sea. From a sandy beach at the head of the bay, a fertile valley, almost flat, extends for about three-quarters of a mile inland whence it is hemmed in by steep mountain spurs. There is good holding ground in depths of from 60 feet to 20 fathoms (18m to 36m) anywhere inside a line joining the entrance points, but the best anchorage is towards the south-eastern corner, in depths of 14 fathoms (25m), mud and sand, with a chapel on a spur northward of Turanköy bearing about 245°. North-easterly winds of

*Chart 907.*

any strength raise some sea at this anchorage, however, and, despite its size, Fatih limanı does not afford as good an anchorage as Obus limanı.

- Between Fatih limanı and Kapsala burnu, the eastern extremity of  
 5 Kapıdağ yarımadası, about 11 miles eastward, the coast is steep and cliffy and the mountain spurs rise abruptly from the sea and are covered with trees and bushes. Kapsala burnu is cliffy, and a sunken ledge with a rock, 6 feet (1m8) high, near its outer end, extends about 2 cables north-north-eastward from the point.

- 10 A light is exhibited, at an elevation of 115 feet (35m0), from a white concrete tower and dwelling, 31 feet (9m4) in height, situated on Kapsala burnu ( $40^{\circ} 29' N.$ ,  $28^{\circ} 02' E.$ ).

- Vessels can anchor nearly anywhere between Fatih limanı and Kapsala burnu, in depths of from 12 to 20 fathoms (21m9 to 36m6), about 2 cables  
 15 offshore over a bottom varying between mud, sand and gravel; the better holding ground is in the greater depths. There are many sandy bights on this stretch of coast but none is of sufficient size to give shelter to large vessels; boats can land and small craft can obtain shelter in the eastern corners of these bights.

- 20 *Charts 807, 224.*

- Submarine exercise area.**—Submarines frequently exercise in an area north-eastward of Kapsala burnu, included between the parallels of  $40^{\circ} 36\frac{1}{2}' N.$  and  $40^{\circ} 43\frac{1}{2}' N.$ , and Longitudes  $28^{\circ} 00' E.$  and  $28^{\circ} 26' E.$  A good look-out should be kept for them when passing through this area;  
 25 see pages 21 and 101.

- Mola adaları.—Light.—Anchorage.**—Mola adaları, a group of three islands, lies east south-eastward of Kapsala burnu, from which Fener (A. Andrea) adası, the nearest island, is distant about  $1\frac{1}{2}$  miles. They are all rocky, and above-water rocks lie close off them in several places.  
 30 Fener adası, the largest island, is 200 feet (61m0) high. Sedef adası (A. Georgios), 150 feet (45m7) high, and Haliada (Mexa), 110 feet (33m5) high, lie about one mile east-north-eastward, and about 4 cables east-south-eastward, respectively, of Fener adası.

- Mola bankı (Agría Petra) a rock awash, lies about three-quarters of a  
 35 mile south-eastward of Haliada. It seldom shows and is separated from Haliada by a channel about 3 cables wide with depths of from 12 to 17 fathoms (21m9 to 31m1). A bank on which the depths are 36 feet (11m0) and less, extends about 6 cables westward, and 3 cables south-westward from Mola bankı.

- 40 A light is exhibited, at an elevation of 141 feet (43m0), from a white metal mast on a dwelling, 39 feet (11m9) in height, situated on the north-western extremity of Fener adası.

- Good anchorage may be obtained under the lee of Mola adaları in north-easterly winds, in depths of about 14 fathoms (25m6), with the  
 45 western extremity of Fener adası bearing  $333^{\circ}$ , and the southern extremity of Haliada bearing  $095^{\circ}$ . The bottom here is coralline over mud.

*Chart 907.*

- A bank on which the depths are less than 60 feet (18m3) which extends south-westward from the western part of Fener adası, is not so good an  
 50 anchorage as that described above, the bottom being mostly sand.

- BANDIRMA KÖRFEZİ.—General remarks.**—Bandırma körfezi (Peramo bay) is entered between Kapsala burnu ( $40^{\circ} 29' N.$ ,  $28^{\circ} 02' E.$ ) and a 60-foot (18m3) point about 6 miles south-south-eastward, and lies  
 55 southward of it. It is fully exposed to north-easterly winds from which

*Chart 907.*

there is no protection, excepting in two small anchorages, described below on the north-western side of the gulf.

On the south-eastern side of Kapıdağ yarımadası are the villages of Çakıl (Muhania), about 7 cables south-south-westward of Kapsala burnu; Karşıyaka (Peramo), about 2 miles farther south-westward; and Tatlısu (Ermeni kioi), about 4 miles west-south-westward of Karşıyaka. Çakıl has a small mole for the protection of small craft (and the shape of the coast affords some shelter at Karşıyaka). The village of Mamun is situated near the shore at the head of the gulf.

Between the 60-foot (18m3) southern entrance point and the town of Bandırma, about  $4\frac{1}{2}$  miles west-south-westward, the southern shore of the gulf is rocky and for the most part precipitous and steep-to. The village of Dutliman is situated about half a mile south-westward of the southern entrance point.

**Anchorage.**—Kum limanı about midway between the villages of Karşıyaka and Tatlısu, has a considerable area available for anchorage, in depths of from 11 to 18 fathoms (20m1 to 32m9), mud. Kışla burnu (Velar burun) its eastern entrance point, affords a little shelter from north-easterly winds but these winds draw too far easterly to prevent all the swell from entering the bay.

The bay off Tatlısu, into which the swell does not penetrate so much, affords better anchorage in depths of 14 fathoms (25m6), with Bakrač burnu about three-quarters of a mile eastward of the village bearing about  $068^\circ$  and in line with Kalın burnu ( $40^\circ 25' N.$ ,  $27^\circ 57' E.$ ), about 6 cables farther east-north-eastward, and a small cliffy point in the bay bearing  $358^\circ$ .

Small craft can find anchorage off the village of Dutliman where there is a small mole; the holding ground is good.

*Charts 844, plan of Bandırma limanı, 907.*

**Bandırma limanı.**—**Harbour.**—**Lights.**—**Danger.**—Bandırma limanı lies at the southern corner of the head of Bandırma körfezi. The town of Bandırma is situated on the eastern shore of the bay and stands on the slope of a hill facing westward. About three-quarters of a mile inland from the town, the land rises to an elevation of 260 feet (79m2) and thence slopes downward almost imperceptibly southward. Westward of this dip rise the bare, rounded summits of Deliklitaş tepe (Delekli), 1,150 feet (350m5) high, and eastward, spurs rise steadily to the higher peaks of Karabayır (Kara dağ) ( $40^\circ 22' N.$ ,  $28^\circ 16' E.$ ), about 13 miles eastward of the town.

A prominent mosque with two large slate-coloured domes, is situated near the southern end of the town.

There is a small artificial harbour, formed between a mole which projects about 2 cables west-north-westward from the shore abreast the northern part of the town, and a breakwater with an elbow about  $1\frac{1}{4}$  cables southward of the mole. Vessels not exceeding 300 feet (91m4) in length and 20 feet (6m1) draught, can berth on the southern side of the outer end of the mole. The breakwater has depths of from 6 to 26 feet (1m8 to 7m9) alongside its northern side, and from 6 to 20 feet (1m8 to 6m1) alongside its southern side, and vessels not exceeding 250 feet (76m2) in length can be accommodated there.

A light is exhibited, at an elevation of 20 feet (6m1), from a red, metal, structure on the head of the mole.

Two lights, disposed vertically, are exhibited, at an elevation of about 21 feet (6m4), from a white metal mast at the head of the breakwater.

*Chart 844, plan of Bandırma limanı.*

A detached 27-foot (8m2) patch is charted about 2½ cables north-north-eastward of the head of the mole and about 2 cables offshore.

- Light-buoy.—Harbour works.**—A can light-buoy, painted black above white, exhibiting a *red flashing light every three seconds*, is moored 6 cables west-north-westward of the root of the mole.

In 1966, submerged obstructions extended west-north-westward from the head of the mole, and works were in progress. Vessels are cautioned to pass westward of the light-buoy.

- 10 Anchorage.**—The is good anchorage off the entrance to the harbour in depths of about 11 fathoms (20m1), about one cable north-westward of the head of the southern breakwater, but *see Regulations*, below. Strong north-easterly winds raise a heavy sea at the anchorage. An appreciable current has been experienced here.

- 15 Port facilities.**—Small quantities of coal and of diesel oil are stocked. Spring water is plentiful and good.

A wharf about 600 feet (182m9) in length is situated southward of the breakwater and is used for loading small craft. Vessels generally discharge into lighters of which a number are available.

- 20** There is a small hospital at Bandırma.

Bandırma is the principal port of call for vessels trading between İstanbul and Western Anadolu. In 1955, the population was 25,515.

- Harbour limits.**—The outer harbour is contained between a line drawn westward for 1½ miles from Zangana burnu (40° 21½' N., 27° 59' E.), **25** thence southward to the shore.

The Inner harbour is contained within the line joining the heads of the mole and the breakwater.

**Regulations.**—Bandırma is a port of entry and exit from Turkey; *see* page 120.

- 30** Similar regulations to those for Karabiga, *see* page 110, are in force for Bandırma, and copies should be obtained from the Port Authority.

Among these regulations are included:—

Vessels of small tonnage anchor in Inner harbour.

Vessels of large tonnage anchor in Outer harbour.

- 35** No vessel must anchor in such position as would hamper the movements of vessels berthing alongside Mole or quays.

Vessels carrying explosives or inflammable materials will be directed to special anchor berths, by the Port Authority.

- The various quays and mole are reserved for certain classes of vessels, **40** as laid down by the Port Authority.

All foreign vessels must anchor as directed, in order to effect clearance of their papers, before they are allowed to proceed alongside any mole or quay.

- All vessels should give at least 24 hours notice of their intended arrival **45** at Bandırma.

**Communications.**—Bandırma is connected by railway with İzmir (*see Mediterranean Pilot, Volume IV.*).

*Chart 907.***EASTERN PART OF THE SOUTHERN SHORE OF MARMARA**

- 50 DENİZİ.—Coast.—Anchorages.**—Between the 60-foot (18m3) southern entrance point of Bandırma körfezi and the small village of Yeniköy (Yeni kioi), about 15 miles eastward, the coast is rocky and for the most part precipitous. Within this stretch of coast the land rises steeply to a wooded range which culminates in Karabayır (Kara dağ), 2,730 feet (832m1) **55** high, about 2 miles inland.

*Chart 907.*

Eastward of Yeniköy the coast becomes low and sandy and the hills recede inland for about  $1\frac{1}{2}$  miles leaving a perfectly flat plain between them and the sea. This plain, which is for the most part inundated in winter, extends for about 2 miles eastward of Sazlı Kahve (Sazkaveh) burnu, situated about  $5\frac{1}{2}$  miles eastward of Yeniköy. The villages on this stretch of coast are small. 5

There is no shelter even for small craft between Bandırma and Sazlı Kahve, but vessels may anchor anywhere from about a quarter to half a mile off the western part of this stretch of coast in depths of from 60 feet to 20 fathoms ( $18\text{m}3$  to  $36\text{m}6$ ); the holding ground varies but is generally mud. This mud is very stiff especially off Kurşunlu (Kurshunlu) village, about 10 miles eastward of the southern entrance point of Bandırma körfezi, and from here for about 13 miles eastward, the area available for anchorage widens considerably. 10 15

Karacabey boğazi (Moalitch çay) flows through the centre of a broad plain, Panayırdere ovası, and enters the sea at Sazlı Kahve (Sazkaveh) burnu; this point has probably been formed by debris from the river, and extends about 2 miles northward of the hills, through which the stream finds its way. The narrow pass in the hills, through which the river flows, is open when bearing about  $200^\circ$ , and is plainly visible from seaward. The plain extends about 4 miles on either side of the stream; on it are lagoons and swamps. The mouth of the river is about one cable wide. 20

The position of the bar varies, and the depths on it range from 3 to 7 feet ( $0\text{m}9$  to  $2\text{m}1$ ). When there is much water in the river, and consequently a strong current running out, a very slight wind from northward raises a considerable sea on the bar, which is then dangerous. Within the bar, a depth of 6 feet will be found, at all seasons, as far as Varvara (Vavara), about 5 miles upstream. 25

There is good holding ground on the mud bank which extends about 2 miles off the mouth of Karacabey boğazi. A berth in 42 feet ( $12\text{m}8$ ), with the western entrance point bearing  $234^\circ$ , will be found convenient. 30

A considerable swell comes in with a north-easterly wind, but H.M. surveying vessel *Fawn* rode out a fresh gale, in 1880, without dragging her anchors, and it was found that the thick river water lessened the sea considerably. 35

*Chart 844, plan of Kalolimno island.*

**Off-lying island. — Lights. — Danger.** — Imralı adası (Kalolimno island) situated with Sigburun (Lena point) ( $40^\circ 31' \text{ N.}, 28^\circ 32' \text{ E.}$ ), its southern extremity, about 7 miles northward of Sazlı Kahve burnu, lies on a bank, which affords good anchorage. 40

A considerable portion of the island is cultivated, and its shores teem with fish.

The principal town stands on the northern shore of Doğuliman (East bay), which is entered southward of Değirmen burnu (Milos point), on the eastern side of the island. There are several small monasteries, the principal one being that of Sotiras, situated on the south-western side. 45

A light is exhibited, at an elevation of 82 feet ( $25\text{m}0$ ), from a stone column, 16 feet ( $4\text{m}9$ ) in height, situated on Değirmen burnu.

A light is exhibited, at an elevation of 360 feet ( $109\text{m}7$ ) from a white concrete tower, 16 feet ( $4\text{m}9$ ) in height, situated about three-quarters of a cable south-eastward of Marti burnu (Agios Elias point) the north-western extremity of the island. 50

The surface of the island is much broken; the highest peak, a sharp cone, 690 feet ( $210\text{m}3$ ) high, on which is Agios Korfi monastery, being at the northern extremity. 55

*Chart 844, plan of Kalolimno island.*

From Siğburun, which is low, Siğburun resifi (Lena reef), a narrow ridge of sand and coral, with patches with less than 6 feet (1m8) over them in places, extends south-south-westward for about 2 miles, where the  
 5 depths increase suddenly from 12 feet to 20 fathoms (3m7 to 36m6). This reef is nearly always visible, and the current frequently races over and round it, creating overfalls, which help to indicate its position.

**Local magnetic anomaly.**—Local magnetic anomalies have been reported, in 1963, in the channel southward of İmralı adası as well as in  
 10 the vicinity of the whole island.

**Anchorage.**—Doğuliman is the best anchorage in ordinary summer weather, but in the heavy gales of winter, Batiliman (West bay) is preferable. A good berth in Doğuliman is in 60 feet (18m3), sand and mud, fair holding ground, about 2 cables from the town, with Değirman burnu, on  
 15 which are three mills, bearing 037°. Small local craft lie close to the town, within a small mole.

Batiliman affords good shelter in northerly and north-easterly winds. A good berth is, in 36 feet (11m0), with Marti burnu, the north-western extremity of the island, bearing 357°, and a monastery southward of  
 20 Trikos point, about 7 cables south-eastward, bearing 081°, but a small vessel can anchor closer inshore with advantage.

*Charts 907, 908.*

**Nine-fathom patches.**—About 2 miles west-north-westward of Marti burnu there are some patches of sand and coral, with a least depth  
 25 of 54 feet (16m5) over them, known as Nine-fathom patches.

*Chart 908.*

**Sazlı Kahve burnu to Arnavut burnu.**—**Coast.**—**Anchorage.**—Eşkel limanı, a small bay entered south-westward of Burunucu (Utguburnu (40° 23' N., 28° 41' E.), about 7½ miles eastward of Sazlı Kahve  
 30 burnu, affords anchorage in fine weather in depths of from 42 to 54 feet (12m8 to 16m5); there is good landing at a small mole at all times.

Between Burunucu and Arnavut (Arnaut) burnu, about 9 miles eastward, the coast is cliffy and steep and the ground within it rises in ridges and spurs to the high land of Kuzgumbayırı (Kuzghundjuk bair), about  
 35 2 miles inland; on this stretch of coast are the villages of Tirilye (Trilia) and Siği (Sii).

**Submarine Exercise area.**—Submarines exercise frequently within the area, indicated on the charts, northward of İmralı adası. A good lookout should be kept for them when passing through this area; see  
 40 pages 21 and 101.

**GEMLIK KÖRFEZİ. — General remarks. — Light. — Aspect.** — Gemlik körfezi (İndjir lıman or Gulf of Mudania), lies between the mountainous Bozburun yarımadası (Boz peninsula) and the mainland southward. It is entered between Arnavut burnu (40° 23' N., 28° 52' E.)  
 45 (see above) and the south-western extremity of Boz burun, a bold and cliffy headland, the south-western extremity of which lies about 9 miles north-north-westward of Arnavut burnu.

A light is exhibited, at an elevation of 249 feet (75m9), from a white stone tower and dwelling, 28 feet (8m5) in height, situated about one mile  
 50 northward of the south-western extremity of Boz burun.

*Charts 908, 224.*

The gulf is bordered by mountains. Most of them are bare or covered with stunted brushwood, but the higher peaks, such as those in the centre of Bozburun yarımadası, and the lofty Kieulu dağ, 4,160 feet (1,268m0)

*Charts 908, 224.*

high, about 7 miles east-south-eastward of the head of the gulf, are well covered with pine forests.

Keşiş (Keshish) dağ, at the foot of which stands the town of Bursa (Brusa) ( $40^{\circ} 11' N.$ ,  $29^{\circ} 04' E.$ ) is conspicuous. The summit of this mountain, a long bare ridge, stretches in a west-north-westerly and opposite direction, with small peaks of nearly equal elevation; the highest of these peaks, the third from the western end of the ridge, is 8,190 feet (2,496m3) high and lies about 24 miles south-eastward of Arnavut burnu.

There are numerous villages on or near the coast. The valleys in the vicinity of the gulf are, for the most part, cultivated.

*Chart 908.*

**Anchorage.**—The gulf is open westward, is deep throughout, and there are but two fair anchorages, one a short distance south-eastward of Boz burun, the other at the head of the gulf in Gemlik limani, *see* page 126.

Mudanya (*see* below) is used as the port of Bursa, and has most of the trade, but the anchorage is very inconvenient, not to say unsafe. A short and steep sea gets up with any fresh wind, and heavy squalls come off the mountains.

Vessels running for shelter in a northerly gale can find convenient and safe anchorage about  $2\frac{1}{2}$  miles east-south-eastward of the south-western extremity of Boz burun off the village of Armutlu (Armudli); this anchorage is much less out of the way than that off Gemlik. (*see* page 127).

**Submarine Exercise area.**—Submarines exercise frequently in Gemlik körfezi. A good lookout should be kept for them when passing through these waters; *see* page 21.

*Chart 844, plan of Mudania roads.*

**SOUTHERN SIDE OF GEMLİK KÖRFEZİ.—Coast.**—Arnavut burnu ( $40^{\circ} 23' N.$ ,  $28^{\circ} 52' E.$ ) (page 124) shows up well from westward; a very prominent road winding round it about half-way up to the summit, serves also to distinguish it.

**Mudanya limanı.—Anchorage.**—The town of Mudanya stands on a plain closely backed by cultivated hills about three-quarters of a mile east-south-eastward of Arnavut burnu. On the summit of one of these hills are two prominent windmills, without sails. The locality is populous, the town itself having a population of 5,925 in 1955.

Mudanya limanı, which fronts the town, is entirely open, and cargo from vessels at anchor is transported by lighters which cannot be used in bad weather. The anchorage is indifferent, the coast being steep-to and the depths off it shoaling rapidly within depths of 15 fathoms (27m4). Vessels must anchor in depths of 20 fathoms (36m6) to have room to veer, and, as heavy squalls sometimes come suddenly from north-westward, a good look-out should be kept. The best anchorage berth is in 20 fathoms (36m6), mud, about 2 cables eastward of the head of the Town quay.

Mudanya limanı is the port of Bursa ( $40^{\circ} 11' N.$ ,  $29^{\circ} 04' E.$ ) (Chart 224), a town with a population of 153,866 at the 1960 census, and the principal centre of silk production in Turkey; *see* page 2. Bursa, distant about 15 miles, is connected by rail.

**Quays.—Piers.—Foul ground.**—A concrete jetty, known as the Town quay, extends about 410 feet (124m9) north-eastward, and thence about 300 feet (91m4) north-westward from the shore about 11 cables east-south-eastward of Arnavut burnu. Passenger vessels and vessels trading regularly with Mudanya berth alongside both sides of this quay, at the head of which is the usual landing place. It was reported, in 1966, that there were depths of 44 feet (13m4) alongside the outer side, and of 23 feet (7m0)



*Chart 844, plan of Mudania roads.*

alongside the inner side, of the jetty head, and depths of from 30 to 33 feet (9m1 to 10m1) alongside the eastern side of the jetty.

Two small piers are situated about one cable, and 6 cables, respectively, south-eastward of the Town quay. Foul ground extends about half a cable offshore  $1\frac{1}{2}$  cables south-eastward of Town quay.

**Oil pipe-line.—Mooring buoys.**—An oil pipe-line extends north-north-eastward from the shore for about three-quarters of a cable from a position about half a mile south-eastward of Town quay. There are some tanks close south-eastward of the root of the pipe-line. Three mooring buoys provide a berth where a vessel can secure stern to the seaward end of the pipe-line; vessels secure stern-to two mooring buoys and bows-to a single mooring buoy, bows north-east.

**Explosives anchorage.**—Vessels carrying explosives or inflammable materials are required to anchor in an area between  $2\frac{1}{2}$  and 10 cables eastward of Town quay.

**Regulations.**—Special regulations, similar to those in force at Karabiga (page 110), copies of which should be obtained by vessels proceeding to Mudanya limanı, are in force for anchorage, berthing alongside the quay or piers, and for vessels carrying inflammable or explosive cargo.

*Chart 908.*

**Southern side of Gemlik Körfezi (continued).—Coast.**—Between Mudanya and Tuz burnu (Tuzla burnu) ( $40^{\circ} 25' N.$ ,  $29^{\circ} 06' E.$ ), about 10 miles eastward, there is a bay in which the depths are too great for convenient anchorage, but in Kavaklı liman, close eastward of Kurşunlu (Kurshunlu) village, situated on the coast about 5 miles south-westward of Tuz burnu, the anchorage is similar to that of Mudanya. Within the coast, between the villages of Kurşunlu and Altıntaş about 2 miles farther westward, Filar dağı, which is craggy, rises to an elevation of 1,940 feet (591m3).

Tuz burnu is low and sandy with marshes within it; in 1909, this point was reported to extend one cable farther northward than charted.

A dolphin, with some moorings near it, stands 11 cables eastward of Tuz burnu; a pipe-line is laid between the dolphin and the shore south-eastward.

*Chart 844, plan of Gemlik bay.*

**GEMLIK LIMANI.—Landmarks.**—The town of Gemlik stands at the head of the gulf. Göldere (Gemlik dere), the rapid but shallow outlet of İznik gölü, about 9 miles eastward, flows through a valley south-eastward of the town. The hills in the vicinity are covered with trees.

Fish traps extend for about three-quarters of a cable off the southern shore near the head of the gulf.

The following objects near the head of the gulf are good marks; a minaret on the northern side of the mouth of Göldere; a chimney about 2 cables southward of this minaret; and a bridge over some hot springs about 2 cables southward of the chimney.

**Anchorage.**—The most sheltered position is in the south-eastern corner of the head of the gulf and a very good berth will be found in a depth of 14 fathoms (25m6), with the bridge over the hot springs bearing  $122^{\circ}$ , and the minaret at the southern end of the town bearing  $040^{\circ}$ . Small vessels can lie closer inshore with advantage. Though westerly winds blow home here they raise little sea and the holding ground of mud is good.

**Jetties.**—The Town jetty, constructed of concrete and 558 feet (170m1) long, extends west-south-westward, from a position close north-north-

*Chart 844, plan of Gemlik bay.*

westward of Göldere. In 1962, it was reported that vessels not exceeding 328 feet (100m0) long and 11-foot (3m4) draught could berth alongside both sides. Caution is advised when berthing alongside the northern side as rocks, with a depth of 7 feet (2m1) over them, are reported to lie off this side. 5

Two piers in ruins lie close southward and about  $2\frac{1}{2}$  cables southward of the Town jetty.

**Harbour limits.**—The harbour area, comprising the outer and inner anchorages, lies eastward of a line drawn between Tuz burnu and Dalyan burnu, about  $2\frac{1}{2}$  miles north-north-eastward. The outer anchorage is bounded on its eastern side by a line drawn southward from a position 2 miles south-eastward of Dalyan burnu to the southern shore. The inner anchorage lies between the eastern limit of the outer anchorage and the shore eastward. 10

**Explosives anchorage.**—Vessels with inflammable or explosive cargoes must anchor in the outer anchorage southward of a line drawn westward from Göldere. 15

**Regulations.**—Special regulations, similar to those for Karabiga and Bandirma (pages 110 and 122), are in force for vessels proceeding to Gemlik. Copies should be obtained from the Port Authority. 20

*Chart 908.*

**NORTHERN SIDE OF GEMLIK KÖRFEZİ.—Anchorage.**—Boz burun, the headland forming the western extremity of Bozburun yarımadası, is steep-to and may be rounded at a distance of about half a mile. A bank with depths of from 48 to 54 feet (14m6 to 16m5) over it, extends about half a mile north-westward from Boz burun light-structure, whence the depths increase abruptly to about 20 fathoms (36m6). 25

Boz burun light is described on page 124.

From the south-western extremity of Boz burun, the northern side of Gemlik körfezi trends east-south-eastward for about  $9\frac{1}{2}$  miles to Yassiburun, which is steep-to and rises to a hill, 520 feet (158m5) high close within it. 30

A bank with depths of 36 feet (11m0) and less over it extends about 7 cables south-eastward from Meyhane (Meykhane) burnu, a small point situated about three-quarters of a mile east-south-eastward of the south-western extremity of Boz burun. 35

During northerly winds good anchorage, referred to on page 125, may be obtained about 2 miles east-south-eastward of the south-western extremity of Boz burun and about one mile southward of Armutlu (Armudlı), ( $40^{\circ} 31' N.$ ,  $28^{\circ} 50' E.$ ), a village situated about  $1\frac{1}{2}$  miles eastward of Meyhane burnu. The best berth is eastward of the bank extending off the latter point, in depths of about 60 feet (18m3), with the south-western extremity of Boz burun bearing  $295^{\circ}$ , and the rounded summit of Muska (Moskov) tepe, 1,093 feet (333m0) high, situated about  $1\frac{1}{2}$  miles eastward of Boz burun light-structure, bearing  $342^{\circ}$ . 45

**BOZBURUN YARIMADASI.—Aspect.**—Bozburun yarımadası consists of a mass of lofty mountains intersected by numerous valleys and passes. The highest point on the peninsula is Tazdağ (Tash dagh), 3,022 feet (921m0) high, about  $6\frac{1}{2}$  miles eastward of Boz burun light-structure, but Yel dağ, about 5 miles north-eastward of Gemlik and therefore not strictly on the peninsula, is 3,141 feet (964m0) high. 50

*Charts 908, 497.*

**Northern side of Bozburun yarımadası.—Coast.—Light.**—From Boz Burun light-structure the northern side of Bozburun yarımadası trends

*Charts 908, 497.*

east-north-eastward for about 18 miles to Deveboynu (Deve Boyunu) burnu, and is steep-to with no off-lying dangers. On account of its quoin-like shape and steep cliffs, 100 feet (30m5) in height, facing northward,

- 5 Deveboyny burnu shows up prominently from westward or eastward. A rock, awash, is charted about one cable north-westward of this point. *Chart 497.*

From Deveboynu burnu to Çatal (Chatal) burun, a low, sandy point which forms the southern entrance point of İzmit körfezi, about 11 miles  
10 east-north-eastward, the coast changes in character and consists of a sandy beach backed only by low spurs as the higher hills recede farther inland. The shorebank fringing Çatal burnu does not extend more than half a cable offshore.

- Yalova, situated on the coast about midway between Deveboynu burnu  
15 and Çatal burnu, is the principal town in the locality and has a stone pier about one cable in length, used by the gulf ferry boats, with a depth alongside of 9 feet (2m7). There are some prominent farmhouses on the coast between Yalova and Çatal burnu. Yalova itself is easy to identify as it is the only town in the vicinity, though fixing the vessel's position  
20 becomes difficult as the town is approached.

Samanli dere enters the sea about one mile westward of Yalova, its mouth being protected by a small breakwater which forms a small harbour; the breakwater is private. In 1880, there was a narrow bar across the mouth of Samanli dere over which there were depths of 4 feet (1m2) and  
25 which was marked by breakers in a fresh breeze; at that date, the bar could be crossed by small craft in nearly all weather.

A light is exhibited, at an elevation of 26 feet (7m9), from a white, pyramidal tower 18 feet (5m5) in height, situated on the head of the breakwater (40° 40' N., 29° 15' E.).

- 30 *Charts 908, 224.*

**Submarine Exercise area.**—Submarines exercise frequently within the area, indicated on the charts, northward of Bozburun yarımadası. A good lookout should be kept for them when passing through this area; see pages 21 and 101.

- 35 *Charts 908, 497.*

**Anchorage.—Landing places.**—There is no safe anchorage on this part of the coast. In southerly winds a vessel can bring up, however, on a narrow bank off the village of Engere (Enger), about 6 miles westward of Deveboynu burnu, but she could not remain with an on-shore wind;  
40 the same may be said of the bay on the western side of Deveboynu burnu.

Temporary anchorage can be obtained off the village of Koruköy (Kuru kioi), about one mile eastward of Deveboynu burnu, in from 12 to 18 fathoms (21m9 to 32m9).

- The best anchorage off this coast is about 3½ cables north-westward of  
45 the breakwater at Samanli dere, in a depth of 19 fathoms (34m7), mud, with the light-tower bearing 144°; the holding ground is good and there is plenty of room. There is also good anchorage off Yalova town, about 1½ cables from the pierhead.

On the northern coast of Bozburun yarımadası there are small break-  
50 waters sheltering landing-places for boats, at the following places, besides that at the mouth of Samanli dere:—Hamburun (Hum burnu) and Paşa Liman (Pasha) iskelesi, about 4 and 2½ miles, respectively, westward of Deveboynu burnu; on the western side of Deveboynu burnu; and half a mile westward of Koruköy. Landing can generally be effected at Enger  
55 (40° 39' N., 29° 01' E.).

*Chart 497.*

**İZMİT KÖRFEZİ.**—General remarks.—İzmit (İsmid) körfezi is entered between Çatal burnu and Yelkenkaya burnu ( $40^{\circ} 45' N.$ ,  $29^{\circ} 21' E.$ ) about  $3\frac{1}{4}$  miles north-north-westward; the town of İzmit (İsmid) is situated at its head. The shores of the gulf are, in general, very steep-to, and convenient anchorage is only to be found at certain places. It is divided into three basins by the approach of the shores to one another in two places. The eastern one of these forms a good harbour, with convenient depths throughout. 5

The borders of the gulf present an alternation of tree-clad mountain, valley, and plain; there are numerous villages, around which the ground is usually well cultivated. 10

Fever is exceedingly prevalent after May, until the break-up of the weather, late in autumn, and at İzmit itself, which is very unhealthy, the residents seem to be liable to it at all times of the year. 15

Very heavy squalls come down the valleys, especially with southerly winds, and in thunderstorms, prevalent in some years, the gusts are sudden and violent. A short choppy sea gets up with strong westerly winds, which sometimes blow completely home to the head of the gulf, making boat work unpleasant, even at İzmit. 20

**Pilotage.**—Pilotage is compulsory. Vessels entering the gulf must await the pilot off Darıca (page 130); the pilot usually comes alongside in a grey tug; see also page 12 and "Regulations", below.

**Caution.**—The landing places of submarine cables are usually indicated by black and white marks illuminated at night. Ships should not anchor within one cable distance of any submarine cable so distinguished. 25

**Regulations.**—Copies of the regulations for vessels entering İzmit körfezi should be obtained, but the following are included in these regulations.

Vessels are prohibited from entering the gulf without the previous sanction of the Turkish government. 30

Vessels must stop off Darıca (Deridja) ( $40^{\circ} 45' N.$ ,  $29^{\circ} 23' E.$ ) to embark the pilot and a Turkish official before proceeding into, and to disembark him before leaving the gulf, and must at all times act according to the signals displayed at the Darıca signal station. In the event of failure to obey the signals three blank rounds will be fired as a warning, and, should the signal be still disregarded, effective fire will be opened on the offending vessel. 35

Vessels are prohibited from entering the gulf between sunset and sunrise, but may leave the gulf at any time, provided six hours notice has been given to Darıca. 40

Vessels may only proceed to the place specified by the Turkish government, and may not visit any other place in the gulf.

Permission to enter the gulf is not granted to foreign men-of-war or yachts. 45

Foreign passengers are not permitted to use cameras or field glasses while in the gulf, and are under the orders of the police at the points of embarkation or disembarkation. Cameras, field glasses and writing material are inspected by a special Turkish official while vessels are stopped off Darıca, before entering or leaving the gulf. 50

Vessels are prohibited from cleaning bilges or discharging oil from tanks anywhere within İzmit körfezi.

**Submarine cable.**—Prohibited anchorages.—A submarine cable, indicated on the chart, crosses the outer part of İzmit körfezi in a south-south-easterly direction from a position about  $3\frac{1}{4}$  miles east-north- 55

**Chart 497.**

eastward of Darica signal station. Anchoring is prohibited in the vicinity of the cable.

- Anchorage is also prohibited within an area indicated by pecked lines on the chart, north-north-eastward of Dil burnu ( $40^{\circ} 45' N.$ ,  $29^{\circ} 31' E.$ ), situated about  $7\frac{1}{2}$  miles eastward of Yelkenkaya burnu.

**OUTER PART OF İZMİT KÖRFEZİ.—Anchorage.—Lights.—**

- Signal station.**—Topçu (Topche) koyu, on the southern side of the gulf, is entered between Çatal burnu (page 128) and Dil burnu ( $40^{\circ} 44' N.$ ,  $29^{\circ} 31' E.$ ), about  $6\frac{1}{2}$  miles east-north-eastward. Within the head of this bay the coastal hills again approach the gulf with steep slopes seaward, leaving a narrow plain between their foot and the sea.

- A bank on which the depths are less than 18 feet (5m5) fringes the shore of the bay and extends up to  $2\frac{1}{2}$  cables offshore in the western part and about 4 cables offshore in the eastern part. About 2 miles west-south-westward of Dil burnu and about 4 cables offshore, there are some 9-foot (2m7) patches on the edge of this bank which here is at its greatest distance offshore.

- About  $2\frac{1}{2}$  miles south-westward of Dil burnu is the mouth of Yalak dere, a river which, when in flood, discharges a considerable quantity of muddy water into the gulf and discolours it far beyond the edge of the shorebank.

- Kılıç (Chukur kioi) deresi, which at times is a considerable stream, enters the gulf about one mile east-south-eastward of Çatal burnu after flowing through a broad and fertile valley between Kabaklı dağ and Chukur dağlar.

- Good anchorage may be obtained in Topçu koyu in depths of from 30 feet to 20 fathoms (9m1 to 36m6), mud, from 3 to 7 cables offshore. The best berth is off Topçu iskelesi in the southern part of the bay where boats can effect a landing, but during north-easterly winds better shelter will be found off Kavak iskelesi, *see* page 131.

- The promontory terminating in Dil burnu projects a considerable distance northward into the gulf and is very low; the navigable channel between it and Kaba burnu, on the northern side of the gulf, is only about  $1\frac{1}{4}$  miles wide. A hill, 95 feet (29m0) high, situated about one mile southward of the extremity of Dil burnu, first appears as an island when approaching it from westward. About a quarter of a mile westward of this hill is the village of Hersek.

- A light is exhibited, at an elevation of 39 feet (11m9), from a white, metal pylon, 36 feet (11m0) in height, situated about one cable within the extremity of Dil burnu.

- An extensive bank of sand and mud with depths of less than 18 feet (5m5) over it, fringes Dil burnu and extends about 3 cables northward of the light-structure; this bank is steep-to and should be approached with caution. The sandbank which, northward of the point, forms the core of the bank, varies much in height and extent according to the strength and direction of the previous winds, being at some times above water and at others, awash. The discolouration off the point is due to the currents and does not coincide with the limits of the bank. Vessels rounding Dil burnu should give the point a berth of half a mile.

- Yelkenkaya burnu ( $40^{\circ} 45' N.$ ,  $29^{\circ} 21' E.$ ), the northern entrance point of İzmit körfezi, is bold and moderately steep-to. A rock, 20 feet (6m1) high, lies close off the point.

- A light is exhibited, at an elevation of 66 feet (20m1), from a white, circular, stone tower, 30 feet (9m1) in height, situated on Yelkenkaya burnu.

- Darica (Deridja) burnu lies about  $1\frac{1}{4}$  miles eastward of Yelkenkaya

*Chart 497.*

burnu. A short distance westward of the former point there are some yellow cliffs and a bank on which the depths are less than 30 feet (9m1) extends about 2 cables off it. The village of Darica (Deridja) is situated on the slopes close north-westward of the point.

There is a signal station on Darica burnu ( $40^{\circ} 45' N.$ ,  $29^{\circ} 23' E.$ ).

From Darica burnu the northern side of the gulf trends eastward for about  $5\frac{1}{2}$  miles to Kaba (Kava) burnu and is steep-to. The depths off this stretch of coast are in most places too great for anchorage. Kaba burnu, which is also steep-to, is situated about  $1\frac{1}{2}$  miles northward of Dil burnu.

A light is exhibited, at an elevation of 52 feet (15m8), from a metal tripod on a concrete base, 25 feet (7m6) in height, on Kaba burnu. A fog signal is sounded from the light-structure.

The ruins of an old Byzantine castle stand on the coast at Eskihsar (Eski Hissar), about 2 miles east-north-eastward of Darica burnu, and about three-quarters of a mile north-eastward of the castle is Anibal tepe, a ridge on which is the reputed tomb of Hannibal, marked by two isolated cypress trees which are conspicuous. About one mile farther northward is the village of Gebze (Guebze), in which is the residence of the governor of the district and which contains some minarets and cypress groves which are only visible from certain directions.

**Landmarks.**—The following are good marks on the northern side of the outer part of İzmit körfezi:—Some white cliffs, 230 feet (70m1) high, about 3 cables northward of Yelkenkaya burnu; the three tall chimneys of a large factory, situated about  $3\frac{1}{2}$  cables east-north-eastward of Yelkenkaya burnu but hidden by the land when approaching from westward; an old mill standing at an elevation of 360 feet (109m7) on a ridge about three-quarters of a mile north-eastward of Yelkenkaya burnu; and the tall chimneys of another factory, situated on the coast about half a mile west-south-westward of Eskihsar.

**CENTRAL PART OF İZMIT KÖRFEZİ.—Southern shore.**

**Anchorage.**—**Light.**—**Jetties.**—**Buoys.**—Between Dil burnu and Kavak iskelesi, about 4 miles south-eastward, the coast is fringed by a bank which, with depths of less than 18 feet (5m5) over it, extends in places up to  $3\frac{1}{2}$  cables offshore. Good anchorage may be obtained off this stretch of coast.

Hersek gölü, a large and shallow lagoon is connected with the gulf about  $1\frac{1}{2}$  miles southward of Dil burnu, but its entrance is obstructed by a fish weir.

Anchorage may be obtained off Kavak iskelesi in depths of from 11 to 14 fathoms (20m1 to 27m4); the holding ground is very good and there is sufficient room and fair shelter, but north-easterly winds raise a short, choppy sea.

Between Kavak iskelesi and Gölcük burnu, about  $11\frac{1}{2}$  miles east-north-eastward, there are several villages, Karamürsel (Karamusal), about  $2\frac{1}{2}$  miles eastward of Kavak iskelesi, being the largest. Between Karamürsel and Gölcük burnu, mountains rise close within the coast in successive ranges to an elevation of 3,700 feet (1,127m8) with valleys between them.

There is no good anchorage off the coast between Kavak iskelesi and Gölcük burnu, but vessels may anchor in depths of about 20 fathoms (36m6) with room to swing, almost anywhere off this stretch of coast; squalls off the mountains, however, make desirable more space than is generally available.

Gölcük burnu, the southern entrance point of the head of İzmit körfezi, 55

*Chart 497.*

is a low sandy point off which a shoal bank extends about three-quarters of a cable.

A light is exhibited, at an elevation of 16 feet (4m9), from a white concrete tower, 16 feet (4m9) in height, situated on Gölcük burnu (40° 44' N., 29° 48' E.).

A conspicuous chimney stands about half a mile southward of the light-structure.

A wooden jetty about 150 feet (45m7) in length extends north-north-westward from the shore about 6 cables west-south-westward of the light-structure; a large clock tower stands southward of the jetty. A jetty, about 126 feet (38m4) long, extends north-north-westward from the shore about one cable east-north-eastward of the wooden jetty. An L-shaped wharf is situated about one cable farther east-north-eastward.

Four mooring buoys lie between 2 and 4 cables westward of Gölcük burnu. A mooring buoy lies about one cable east-south-eastward, and two similar buoys lie 6½ cables farther east-south-eastward, of the same point.

Two trots of mooring buoys, laid in a north-west/south-east direction, lie about half a mile eastward of Gölcük burnu; the northernmost of these buoys is moored about 6 cables north-eastward of the light-structure.

**Northern shore.—Oil installations.—Mooring buoys.—Anchor-  
age.—Light.**—From Kaba burnu (page 131) the northern shore of the gulf trends eastward for about 2½ miles to Tavşancıl (Towshanjik), a village situated on the hills close northward of a point of the same name. The village of Hereke stands on the shores of a bay about 2 miles farther east-north-eastward.

Anchorage in Hereke koyu is not recommended as the holding ground is not good, but in fine weather, temporary anchorage may be obtained here in depths of about 20 fathoms (36m6).

The village of Yarımca (Yaremdji) is situated about 5 miles eastward of Hereke. An oil pipe-line extends from the shore in a position about 5 cables westward of Yarımca railway station. Two mooring buoys lie close to the seaward end of the pipe-line. A tank farm is situated about 2½ cables north-eastward of the root of the pipe-line.

Good anchorage in convenient depths over a mud bottom may be obtained off Yarımca and also off the coast between Yarımca and Kiler (Kileri) burnu (40° 45' N., 29° 46' E.), about 2½ miles south-eastward.

From Yarımca, the northern shore of the gulf trends south-eastward for about 3 miles to Zeytin (Zeitun) burnu and is low. Zeytin burnu, a sandy spit about 3 feet (0m9) high, covered with vegetation and enclosing a lagoon, is the northern entrance point of the head of the gulf. A bank on which the depths are less than 3 fathoms (5m5), extends about one cable off the point.

A light is exhibited, at an elevation of 33 feet (10m1), from a white, metal mast and dwelling, 33 feet (10m1) in height, situated on Zeytin burnu.

A conspicuous minaret, the charted position of which is approximate, is situated over 1½ miles north-north-eastward of Zeytin burnu. A white water tower, marked at night by a *red fixed* obstruction light, stands 3½ cables southward of the minaret. An oil refinery is situated 6½ cables west-north-westward of Zeytin burnu. At the installation there is an L-shaped wharf, the approach arm of which is about 330 feet (100m6) long; the head of the wharf is 332 feet (101m3) long, with a depth of 49 feet (14m9) alongside, and is capable of accommodating a vessel of about 42,000 tons; there is a mooring buoy off each end of the wharf. A chimney

**Chart 497.**

of the installation, from which a flare is exhibited, stands about  $2\frac{1}{2}$  cables north-eastward of the head of the wharf.

**Submarine telegraph cable.**—A submarine telegraph cable crosses the gulf in a  $356^\circ$  direction from a position on the southern shore about 7 cables west-south-westward of Gölcük burnu. From the approaches, the notice board (*see* Caution on page 129) is most easily located by a tall cypress tree which stands near it.

**Submarine Exercise area.**—Submarines exercise frequently in an area indicated on the chart about  $4\frac{1}{2}$  miles east-south-eastward of Dil burnu; a good lookout for them should be kept when passing through these waters; *see* page 21.

**HEAD OF İZMIT KÖRFEZİ.—Foul area.—Anchorages.—Lights.—**

From Gölcük burnu, the southern shore of the gulf trends eastward for about  $5\frac{1}{2}$  miles to Başiskele (Bash Iskalessi) at the south-eastern corner of the head of the gulf where there is a landing place. This stretch of coast is low, and within it the mountains recede some distance inland.

A light is exhibited at the head of the pier at Başiskele ( $40^\circ 43' N.$ ,  $29^\circ 55\frac{1}{2}' E.$ ).

A foul area of radius about  $1\frac{1}{2}$  cables, lies with its centre about  $2\frac{1}{2}$  miles westward of Başiskele and about  $2\frac{1}{2}$  cables offshore, and a 15-foot (4m6) patch is charted about 3 cables west-north-westward of Başiskele and about  $2\frac{1}{2}$  cables offshore.

On the northern side of the gulf, Tütün limanı is entered immediately eastward of Zeytin burnu (page 132). A single vessel may obtain good anchorage in the centre of Tütün limanı, in depths of 48 feet (14m6), mud, with the eastern entrance point of the bay bearing  $088^\circ$ , and Tütün çiftlik, a farmhouse about half a mile north-north-eastward of Zeytin burnu, bearing  $358^\circ$ .

From the eastern entrance point of Tütün limanı to Derince (Derinji) burnu, about  $1\frac{1}{2}$  miles eastward, and thence about  $4\frac{1}{2}$  miles farther eastward to the town of İzmit at the north-western corner of the head of the gulf, the coast is low and indented by several small and shallow bights. A number of mooring buoys are laid in the bay westward of Derince burnu ( $40^\circ 45' N.$ ,  $29^\circ 49' E.$ ). Access to these bays and to Tütün limanı is subject to authorisation by the Port Commander at Gölcük, *see* Caution No. 3 on chart.

A light is exhibited, at an elevation of 30 feet (9m1), from a red metal column situated on the head of the centre of a group of three piers which extend from the south-eastern side of the railway pier at Derince burnu (*see* below).

Good anchorage may be obtained in convenient depths anywhere in the head of the gulf. For anchorage off the town of İzmit, *see* page 135. *Charts* 497, 224.

Within the head of the gulf is a low plain which contains the delta of Kilez (Kiles) dere. This river rises south-eastward of the Giuk dağı range, which attains an elevation of 5,330 feet (1,624m6) about 10 miles south-eastward of İzmit. About 4 miles south-eastward of that town it debouches into the plain and flows through marshes, entering the head of the gulf about one mile southward of the town. It is reported that the delta formed by deposit brought down by the river was extending, and that in consequence the depths of the head of the gulf were shoaling. Only shallow draught boats can enter the mouth of the river.

The low plain at the head of the gulf rises imperceptibly to Sapanca gölü (Lake Sebanjeh, chart 2214), about 8 miles eastward; on its southern



*Charts 497, 224.*

side the plain is bounded by the Naldöken dağı range and on the northern side by lower hills.

*Chart 497.*

- 5 **Gölcük.—Port facilities.—Anchorage.**—The naval port and dock-yard of Gölcük is entered immediately south-eastward of Gölcük burnu. There are numerous workshops and warehouses. A prominent yellow signal tower stands at the head of the harbour, about  $3\frac{1}{2}$  cables south-westward of Gölcük burnu.
- 10 Access to the harbour is subject to authorisation by the Port Commander, *see* Caution Number 3 on chart.  
 Fuel oil and Diesel oil for the use of naval vessels is stocked.  
 There is a 90-ton crane and a 30-ton floating sheerlegs in the port and there is a building slip for small craft.
- 15 A floating dock is moored about  $2\frac{1}{2}$  cables eastward of Gölcük burnu; for details, *see* Appendix I.  
 Anchorage may be obtained in the port in depths of 45 feet (13m7), but the swinging space is limited.  
**Prohibited anchorage.**—Anchorage is prohibited in the channel
- 20 between Gölcük and Derince.  
**Derince burnu.—Port facilities.—Buoys.**—There is a port of some commercial importance at Derince burnu, and anchorage off it, although open, is considered safe except in westerly gales which raise a disagreeable sea for boats; these gales, however, are uncommon.
- 25 A railway pier, on the eastern part of which are two large and prominent granaries, extends westward from Derince burnu. There are depths of from 13 to 24 feet (4m0 to 7m3) alongside this pier and vessels not exceeding 450 feet (137m2) in length can berth alongside. Close eastward of the granaries, are three small piers, the eastern one constructed of wood with
- 30 depths of 20 feet (6m1) alongside, while the western pier is of iron, with depths of 14 feet (4m3) alongside it and is used as a landing place for boats.  
 Fuel oil is obtainable at Hacıbayram, *see* below.  
 Very good water can be obtained and is piped to the pier only.  
 At Hacıbayram (Hadji Bairam) burnu, about  $1\frac{1}{2}$  miles eastward of
- 35 Derince burnu, there is an oil pier with a T-head, where large vessels can be accommodated.  
**İzmit.—Prominent objects.**—The town of İzmit (Ismid) ( $40^{\circ} 46' N.$ ,  $29^{\circ} 55' E.$ ) stands amongst trees and gardens on the face of some spurs sloping southward. It is the seat of local government and, in 1955, had a
- 40 population of 56,702.  
 The following objects in this vicinity are good marks:—the Greek church, situated westward of the town, which is painted blue and white, has a central dome, and can be easily identified by a prominent grove of trees close southward of it; a clock tower, situated a short distance westward
- 45 of the western gateway of the former palace of the Sultans, which tower is lighted at night and affords a useful mark; the palace itself, which, though small, is remarkable owing to its white colour and surrounding yellow walls, as well as to its commanding position on a hill above the site of the old dockyard; and a mosque at the eastern end of the town.
- 50 **Bank.—Buoy.**—The bight between the town and the mouth of Kilez dere, described on page 133, and the area off the eastern part of the town are shallow, but off the palace, and as far eastward as the Custom house pier, there are depths of 18 feet (5m5) within one cable of the shore. About half a mile westward of the palace a bank with depths of less than
- 55 18 feet (5m5) extends 2 cables offshore; its outer edge is marked by a conical buoy.

*Chart 497.*

To clear the bank when approaching or leaving, a vessel should keep the clock tower near the palace bearing less than 035°.

**Anchorage.**—**Caution.**—Westerly gales blow completely home off the town of İzmit and raise a disagreeable sea for boats, especially in depths of less than 36 feet (11m0), but winds from this direction are not common and the sea is smooth with winds from any other quarter. 5

There is good anchorage off the town in depths of from 30 feet to 12 fathoms (9m1 to 21m9), stiff mud, the best berth being in depths of about 36 feet (11m0) with the palace bearing 000°, distant about 3 cables. About 10 2½ cables farther southward there is a good berth in depths of from 54 to 60 feet (16m5 to 18m3).

In 1950, it was reported that silting had been taking place for some years at the anchorage.

**Port facilities.**—Opposite the railway station there are three piers. 15 The easternmost pier extends south-eastward and southward and has a depth of 29 feet (8m8) at its head. Vessels not exceeding 450 feet (137m2) in length and 21 feet draught can berth alongside it. The central pier, which extends from the roof of the eastern one, has a depth of 18 feet (5m5) at its outer end, and the western pier, a depth of 5 feet (1m5) at its 20 outer end.

Eastward of the palace and near the office of the Captain of the Port, there are two more piers, each with a depth of 18 feet (5m5) at its outer end.

It is reported that a 10-ton crane has been installed on the western railway pier. 25

There is a hospital at İzmit (40° 46' N., 29° 55' E.).

Fresh provisions are plentiful. Water from artesian wells is available but the supply may fail in summer.

There are a number of lighters at the port. There is a small slipway and several boat slips in the old dockyard. 30

**Trade.**—The principal exports are maize, oats, silk, linseed and tobacco; and the chief imports are manufactured goods, sugar, coffee, iron, rice and petroleum.

**Communications.**—İzmit is connected by rail with Haydarpaşa, Ankara, Konya, Ereğli and Aleppo. 35

**COAST.**—The coast northward of Yelkenkaya burnu is described on page 141.

*Chart 224.*

**DIRECTIONS.**—**Gelibolu to İstanbul.**—The navigation of Marmara denizi presents few difficulties, the weather being normally fine. On 40 leaving the Dardanelles, from a position south-eastward of Çankaya burnu (40° 25' N., 26° 42' E.) vessels may shape course to clear Eriklice burnu (page 103). They should not approach within one mile of the coast as Doğanaslan bankı (page 102) extends about three-quarters of a mile offshore and, in thick weather, they should keep in depths of not less 45 than 12 fathoms (21m8) in this vicinity.

By night, when Hoşköy light is sighted, care should be taken when within a distance of 10 miles from it, to keep it bearing not more than 046° as Eriklice burnu is low and dangerous. See remarks on currents, pages 39 and 44. 50

Should the wind blow hard from north-eastward, even full-powered vessels should not hesitate to close the European coast where there would be less sea; by so doing, time would be gained and the passage shortened.

During daylight, vessels bound for İstanbul generally make a landfall

*Chart 224.*

at Yeşilköy burnu ( $40^{\circ} 57' N.$ ,  $28^{\circ} 50' E.$ ) which is low and of a reddish colour and may be identified by the lighthouse and the houses on it.

For directions for entering the Bosphorus, *see* page 152.

- 5 For regulations for İzmit körfezi, *see* page 129.

- 10 **İstanbul to Gelibolu.**—Vessels proceeding from İstanbul to Gelibolu with a fair wind will always be set southward by the current, but it is not easy to prescribe the exact course to be adopted which must depend on the season and on the prevailing winds. Generally speaking, a mid-channel course between the European shore and Marmara adası should be shaped and the position should be frequently ascertained. In clear weather, by taking the channel southward of Marmara adası, the eastern entrance to which is marked by Fener Adası light, vessels coming in the opposite direction will be avoided. Between Marmara adası and Gelibolu
- 15 the southern set of the current is variable in strength; it is generally slight but is often sufficiently strong to set vessels, dangerously close to Zincirbozan bank unless the position is carefully checked as Gelibolu boğazı is approached. *See* remarks on currents, pages 39–48.

## CHAPTER IV

## THE PORT OF ISTANBUL AND BOSPORUS OR ISTANBUL BOĞAZI

*Charts 1198, 2286, 224.*

**PORT OF İSTANBUL.—Limits of the port.—General remarks.—**  
The port of İstanbul is an open port, *see* page 10, and is accessible to vessels of the largest size. It includes the Golden Horn or Haliç, and the Bosphorus also known as İstanbul boğazi or Karadeniz bogazi. 5

The southern limit of the port, which is indicated on chart 224, is formed by a line drawn from Baba burnu ( $40^{\circ} 59' N.$ ,  $28^{\circ} 33' E.$ ) (page 107) southward for 2 miles, thence east-south-eastward to Yelkenkaya burnu ( $40^{\circ} 45' N.$ ,  $29^{\circ} 21' E.$ ) (page 130), the northern entrance point of İzmit körfezi. 10

The northern limit is a line joining Rumeli ( $41^{\circ} 14' N.$ ,  $29^{\circ} 07' E.$ ) and Anadolu lighthouses, at the northern entrance to the Bosphorus.

The port consists of four sections:—

**The Outer port.**—The Outer port comprises all the area between the northern and southern port limits and a line joining Saray burnu ( $41^{\circ} 01' N.$ ,  $28^{\circ} 59' E.$ ) (page 140) and Kabataş, about one mile north-north-eastward, except for Haydarpaşa. 15

*Chart 1198, with plan of Haliç.*

**Port of Galata.**—The port of Galata (page 149), or Middle port, extends westward of the Outer port as far as Galata bridge. 20

**Inner port.**—The Inner port extends westward of Galata bridge, that part north-westward of Atatürk bridge being known as the Golden Horn or Haliç.

**Haydarpaşa.**—The harbour of Haydarpaşa (page 149) lies on the Asiatic side of the entrance, opposite the City of İstanbul. 25

*Charts 2286, 224.*

**SOUTHERN APPROACH TO THE BOSPORUS.**—The southern approach to the Bosphorus, known to the Turks as Karadeniz boğazi, is deep between Kızıl adalar (page 144) and Yeşilköy (page 139). For vessels going farther up the strait, anchorage off the Asiatic coast southward of the cable area, *see* page 148, is generally preferable to that on the European side of İstanbul, as the former is out of the main current and there is no sea there with northerly winds. 30

**Currents.**—*See* pages 39–48.

**Aspect.**—Vessels approaching İstanbul from Marmara denizi, on passing Yeşilköy burnu ( $40^{\circ} 57' N.$ ,  $28^{\circ} 50' E.$ ) will see the numerous domes and spires of the city on a northerly bearing. On a nearer approach, the southern side of the city will open out with numerous mosques and houses interspersed with cypresses. Near the south-western end of the city is Marmara kulesi, a square building on the coast, and about a quarter of a mile farther north-eastward is an old castle with seven variously shaped towers, known as Yedikule. 40

On the peninsula formed by İzmit körfezi, the Bosphorus and the Black sea, there are several mountains which serve as landmarks from

*Charts 2286, 224.*

- various directions. From westward the most prominent are Aydos dağı, 1,733 feet (528m2) high, situated about 5 miles east-north-eastward of Maltepe burnu (page 143) which is the highest; Kayışdağ (Kaish dagh) 5 (40° 58' N., 29° 10' E.) (page 143), about 4½ miles west-north-westward of Aydos dağı and the intervening hills.

*Charts 1198, 2286, 224.*

- About 3 miles eastward of Kizkulesi at the southern entrance to the Bosphorus are the two rounded summits of Bulgurlu (Mount Bulghurlu). 10 Of these summits Küçükçamlıca, the southern, is 748 feet (228m0) high, and Büyükçamlıca tepe, the northern, is 859 feet (271m0) high; they show up well in front of Alemdağ and Çatal (Chatal) dağı, which lie about 6½ miles east-north-eastward, and 10 miles eastward, respectively, of Bulgurlu and do not appear remarkable from this side. At the western foot 15 of Bulgurlu lies the large town of Üsküdar, with numerous cypresses surrounding a vast cemetery.

Immediately southward of Üsküdar are Selimiye barracks, large buildings, painted yellow with a square tower at each corner.

- Haydarpaşa lyceum, the Turkish school of Medicine, a very prominent 20 building, lies south-eastward of the barracks.

*Chart 2604, with plan of Büyük Çekmece bay.***WESTERN SIDE OF THE APPROACH.—Büyükçekmece koyu.—**

- Dangers.—Anchorage.**—Büyükçekmece (Buyuk Çekmece) koyu is entered between Baba burnu (40° 59' N., 28° 33' E.) and Kayaburun 25 (Manda Tash burnu) about 2½ miles east-south-eastward. This bay affords good and safe anchorage in most seasons and the holding ground of stiff mud throughout is good. The entrance is open southward, from which quarter gales are infrequent in Marmara denizi except during some winters. During southerly winds however, a considerable swell rolls 30 into the bay which, though not endangering well-found vessels, makes the anchorage rough and uncomfortable. In very heavy south-westerly gales such as occasionally occur, the bay cannot be considered a safe anchorage and, in these circumstances, vessels should be prepared to leave it at short notice.

- 35 Büyükçekmece (Buyuk Çekmece) village, in which are two minarets both of which are prominent from seaward, is situated at the head of the bay. A pier extends from the shore southward of the village.

- At the head of the bay close westward of the village is the entrance to Büyükçekmece gölü, a large lagoon in which the depths are nowhere more 40 than 5 feet (1m5), and the northern end terminates in a swamp. A prominent bridge, under which there is a depth of about 2 feet (0m6), crosses the lagoon about 1½ cables within the entrance. Kuşuk deresi and Karasu deresi, two streams which flow down the broad Çatalca valley, discharge into the northern part of the lagoon.

- 50 Sunken and above-water rocks extend about 1½ cables offshore in a position about 2 cables east-north-eastward of the extremity of Baba burnu, and heaps of ballast, with depths of about 15 feet (4m6) over them, lie on the shorebank which, with depths of less than 18 feet (5m5), extends about 4 cables offshore abreast Mimarsinam (Kalikratia), a village on the 45 north-western shore of the bay about 1½ miles north-north-eastward of Baba burnu.

- Sunken rocks and foul ground extend about 2 cables west-south-westward from Kayaburun; the eastern side of the foot of a 315-foot (96m0) hill on the western shore of the lagoon about 1½ miles northward 55 of the prominent bridge, bearing 349° and in line with the western

*Chart 2604, with plan of Büyük Çekmece bay.*

extremity of the bridge, leads about 4 cables westward of these rocks.

The best anchorage in the bay is in depths of 36 feet (11m0) south-eastward of Mimarınam, with the southern minaret in Büyükçekmece village bearing 027°, distant about 8½ cables. 5

*Chart 2604.*

**Kayaburun to Yeşilköy.—Coast.—Lights.—Anchorage.**—From Kayaburun the coast trends eastward for about 6½ miles to Soğuksu burun about one mile westward of which lies the village of Anbarlı (Ambarlı). This stretch of coast is cliffy and fringed by foul ground and rocks nearly 10  
awash in places extending about 2 cables offshore. The outer edge of this coastal bank is steep-to.

Büyükçekmece Değirmen Burnu light is exhibited at an elevation of 65 feet (19m8), from a white concrete tower, 26 feet (7m9) in height, situated on Değirmen burnu, about 1½ miles south-eastward of Kayaburun. 15

About midway between Kayaburun and Anbarlı are some very prominent white marl cliffs.

Between Soğuksu burun and the village of Yeşilköy (San Stefano), about 4 miles east-south-eastward, the coast forms a slight bight which only affords protection during north-easterly winds. Küçükçekmece gölü lies 20  
close within its head. The village of Küçükçekmece (Kuchuk Çekmece) stands at the south-eastern corner of the lagoon about 1½ miles north-eastward of Soğuksu burun and the railway station stands on the north-eastern shore of the bight about one mile south-south-eastward of the village. 25

A large hangar (40° 59' N., 28° 48' E.), situated about 1½ miles eastward of Küçükçekmece village, is conspicuous from seaward.

Fair anchorage may be obtained in the bight southward of Küçükçekmece village; the best berth is in depths of about 12 fathoms (21m9), with the railway station bearing about 042°, distant about 5½ cables. Landing is 30  
not possible during southerly winds.

A light for the use of aircraft is occasionally exhibited, from a position about 1½ miles north-north-westward of Yeşilköy.

**Quay.—Oil pipeline.—Lighter moorings.**—A quay, just over 1½ cables long, extends southward from the shore close to the mouth of 35  
Harami dere, 9 cables westward of Anbarlı village. A dolphin stands 3 cables offshore, 2 cables south-south-eastward of the head of the quay; an offshore oil platform is situated 3½ cables eastward of the dolphin. An oil pipeline is laid in a north-north-westerly direction from the dolphin to the shore; moorings for lighters exist in the vicinity of the dolphin. 40  
*Charts 2286, 1198.*

**Yeşilköy burnu to Saray burnu.—Dangers.—Navigational aids.**—Yeşilköy burnu (Stefano point) (40° 57' N., 28° 50' E.) situated about half a mile eastward of the village of Yeşilköy, is a red cliff from 50 to 60 feet (15m2 to 18m3) high. The village stands on the western and 45  
higher part of the cliff and is the south-westernmost suburb of İstanbul.

A light is exhibited, at an elevation of 75 feet (22m9), from a white stone tower and dwelling, 49 feet (14m9) in height, situated on the eastern extremity of Yeşilköy burnu. There is a signal station and a fog signal 50  
is sounded from the lighthouse.

A sand bank on which the depths are less than 18 feet (5m5) extends about 4 cables south-eastward of Yeşilköy burnu and there are depths of only 36 feet (11m0) about 9 cables south-south-eastward of this point. Vessels bound for the Bosphorus, closing the land to avoid the current setting out of the strait, which however does not pass within 3 miles of Yeşilköy burnu, should be careful to avoid this sand bank. 55

*Charts 2286, 1198.*

The westernmost tower of Selimiye barracks (page 138) bearing 062° and in line with Büyükcamlica tepe, about 2½ miles east-north-eastward, leads in depths of about 11 fathoms (20m1) southward of the bank off  
 5 Yeşilköy burnu. See view on chart 2286.

Between Yeşilköy burnu and Marmara kulesi, about 4 miles east-north-eastward, the coast is fringed by a bank which, with depths of less than 18 feet (5m5), extends as much as 4 cables offshore in places; thence to Ahırkapı burnu, about 2½ miles farther east-north-eastward, its width  
 10 diminishes, and off the latter point it extends about one cable offshore.

Bakırköy (Makri kioi), a suburb of İstanbul, is situated about 2 miles north-eastward of Yeşilköy burnu; at Zeytinlik, about half a mile westward of Bakırköy, are the buildings of some Government powder mills, and two conspicuous chimneys stand on the coast about one mile east-north-  
 15 eastward of Bakırköy.

A light is exhibited, at an elevation of 118 feet (36m0), from a white tower, 95 feet (29m0) in height, situated about 3 cables north-eastward of Ahırkapı burnu. A fog signal is sounded from the lighthouse.

Ahırkapı burnu is fronted by a mud flat on which the depths gradually  
 20 increase from 3 feet to 36 feet (0m9 to 11m0) about 4 cables south-eastward; this mud bank also fringes the coast northward, becoming gradually narrower as far as Saray burnu, about one mile north-north-eastward of Ahırkapı burnu (41° 00' N., 28° 59' E.) A fog signal is sounded close southward of Saray burnu.

25 Works were in progress, in 1969, on a small breakwater for the shelter of fishing craft in a position about 7 cables westward of Ahırkapı burnu; the works were marked by a light-buoy.

Ahırkapı bankı (Seraglio bank), with depths of from 30 to 60 feet (9m1 to 18m3) over it, extends about 4 cables south-eastward and 6½ cables  
 30 southward of Ahırkapı burnu. Depths of 21 and 33 feet (6m4 and 10m1) exist near the outer edge of the bank, 4 cables south-eastward and 6 cables southward, respectively, of the point.

A can light-buoy, painted white, fitted with a radar reflector and exhibiting a *white group flashing* light showing *two flashes every five seconds*, is  
 35 moored about 5 cables southward of Ahırkapı burnu.

**Caution.**—Vessels rounding Ahırkapı burnu should give Ahırkapı bankı a good berth and should on no account attempt to cross it. The palace of Dolmabahçe (page 151), about 2½ miles north-north-eastward of Ahırkapı burnu, bearing 010° and well open eastward of the coast between  
 40 Ahırkapı burnu and Saray burnu, leads eastward of this bank.

**Anchorage.**—There is good anchorage anywhere off the coast between Yeşilköy burnu and Ahırkapı burnu, in from 42 feet to 13 fathoms (12m8 to 23m8), but it is exposed to southerly and westerly winds.

Off Bakırköy and in the western part of this anchorage the better  
 45 holding ground is in the greater depths; westward of Ahırkapı bankı, under the eastern part of the southern walls of the city, where sailing vessels usually anchor while awaiting a fair wind to enter the strait, depths of 12 fathoms (21m9), mud, will be found about 3 cables offshore. Small vessels can lie closer in.

50 There is good temporary anchorage near the south-western edge of Ahırkapı bankı, but, in order to be sheltered from the strength of the current, which sets along its eastern side, vessels should anchor with Kızkulesi, described on page 148, in line with the eastern extremity of Ahırkapı burnu, bearing about 043°; sailing vessels should not anchor  
 55 with the former open eastward of the later, as the current would make it more difficult for them to get under way from a berth eastward of that line.

*Chart 2286, 1198.*

**Cable area.—Prohibited anchorages.**—Owing to the existence of submarine cables, anchorage is prohibited in an area, indicated by pecked lines on the chart, between Ahırkapı burnu and Saray burnu on the west, and the coast abreast Üsküdar on the east. *See note on chart 1198.* 5

For prohibited anchorage for vessels carrying explosives, *see page 148.*

*Charts 497, with plans of Tuzla bay: 224.*

**EASTERN SIDE OF THE SOUTHERN APPROACH TO THE BOSPORUS.—Tuzla Körfezi.—General remarks.—Light.**—Tuzla körfezi, which is entered between Üçburunlar yarımadası (Uch burnu), situated about 2 miles north-north-westward of Yelkenkaya burnu (page 130), and Tuz burnu, about  $3\frac{1}{2}$  miles farther west-north-westward, affords anchorage and protection for a large number of vessels during northerly winds. Although the bay is open south-westward the holding ground is very good and winds from that direction do not raise a heavy sea. The sand and coral which may be brought up by the lead overlays a slimy mud in which the anchor will hold well. 15

*Chart 497, plan of Tuzla bay.*

Üçburunlar yarımadası is a flat peninsula with three low points, and although 70 feet (21m3) high appears lower on account of its shape and is not easily distinguished from the land behind it. 20

Tuz burnu is the southern extremity of a peninsula about 70 feet (21m3) high, and both the point and the coast adjoining it are fronted by rocky flats.

Hayırsız adalar (Deserters islands) consist of Hayırsızada and İncirada, two rocky islets lying about 7 cables south-south-eastward, and one mile south-eastward, respectively, of Tuz burnu. They are situated on separate shoals with a navigable channel between them and the mainland. 25

A light is exhibited, at an elevation of 56 feet (17m1) from a metal framework tower, 13 feet (4m3) in height, situated on the southern extremity of Hayırsızada. 30

Tuzla village is situated at the head of Tuzla körfezi on the shore of a small bight which is centred between Mezarlık (Mezar) burnu ( $40^{\circ} 49' N.$ ,  $29^{\circ} 19' E.$ ), about  $1\frac{1}{2}$  miles north-westward of Üçburunlar yarımadası, and Liman burnu, about 7 cables farther westward. A small mole, which gives shelter to small craft, extends about three-quarters of a cable east-north-eastward from Liman burnu and affords good landing in all weather. 35

A pier about one cable long, within which is a small harbour which was, in 1966, dredged to a depth of about 7 feet (2m1), extends in a southerly direction from the north-eastern shore of Tuzla körfezi about one mile eastward of Mezarlık burnu. Near it are two red brick chimneys and a factory. 40

A jetty, with a depth of 15 feet (4m6) at its head, extends  $1\frac{1}{2}$  cables west-south-westward from the shore about one mile north-eastward of Üçburunlar yarımadası. A light is exhibited on the jetty head. A chimney stands about 3 cables north-eastward of the root of the jetty, and  $3\frac{1}{2}$  cables north-north-westward are the ruins of a jetty. 45

**Current.**—A strong eddy from the main current generally sets westward through Tuzla körfezi, and past Hayırsız adalar. 50

**Dangers.**—Üçburunlar yarımadası is fringed by a sunken rocky flat, parts of which are above water, extending about one cable offshore.

A bank on which the depths are less than 18 feet (5m5) and on which are several above-water and sunken rocks, fronts the northern shore of Tuzla körfezi between Mezarlık burnu and Tuz burnu; it extends about 55



*Chart 497, plan of Tuzla bay.*

1½ cables offshore between Mezarlık burnu and Liman burnu, and up to 2½ cables offshore in places between the latter point and Tuz burnu.

- Above-water and sunken rocks and rocks awash extend off Tuz burnu, the outermost danger being Harmankaya (Selvi rock) with a depth of 6 feet (1m8) over it, situated about 3 cables south-south-westward of the point.

A 32-foot (9m7) patch lies about 2½ cables westward of the southern extremity of Hayırsızada.

- 10 A shoal, over which there are depths of from 10 to 32 feet (3m0 to 9m7), extends about 4 cables north-eastward from İncirada, and a bank with depths of from 30 to 60 feet (9m1 to 18m3) over it, lies about 1½ miles east-north-eastward of the same islet and in the southern approach to the anchorage.
- 15 Adasığlığı (Twenty-two-feet shoal), with a least depth of 24 feet (7m3) over it, lies between positions about 3½ and 6 cables northward of İncirada.

- Directions.—Anchorage.**—The southern sides of Hayırsız adalar are steep to outside half a cable offshore and vessels may pass at a prudent distance southward of these islets. For vessels approaching from north-westward and intending to anchor off Tuzla village, there is a good channel northward of Hayırsız adalar, the leading mark for which is Tavşan (Towahan) tepe, a hill 330 feet (100m6) high, situated about 2 miles east-north-eastward of the village, bearing 060° and in line with the northern peak of a distant saddle hill, *see* view on Chart 497. This line leads in depths of about 36 feet (11m0) to the anchorage off Tuzla village, passing northward of Adasığlığı.

- Anchorage may be obtained anywhere in Tuzla körfezi according to circumstances. Small vessels may obtain convenient anchorage with some protection from westerly gales, in depths of about 42 feet (12m8), with Mezarlık burnu, on which there is a distinctive clump of cypress trees, bearing 087°. Large vessels may obtain a better berth farther southward.

- Tuz burnu to Maltepe burnu.—Coast.—Anchorages.—Danger.**—Sarpburun (Ayios Giorgios) burnu, about three-quarters of a mile northward of Tuz burnu, rises to an elevation of 75 feet (22m9); north-eastward of this point the coast forms a bight which is open north-westward.
- Chart 497.*

- Ekrembey adası (Andreas island) (40° 50' N., 29° 16' E.), about 1½ miles north-north-eastward of Sarpburun burnu, is 145 feet (44m2) high and rocky and has a clump of pine trees on its summit. It is connected with a peninsula 64 feet (19m5) high, about 2 cables south-eastward of it, by a rocky flat on which the depths are 9 feet (2m7). The clump of trees surmounting it, distinguish it from Aydınli (Paulo) burnu about three-quarters of a mile northward, which is of a similar shape but 165 feet (50m3) high and bare. Aydınli burnu is fringed by a narrow, sunken and rocky flat.

- Aydınli (Paulo) limanı is entered between Ekrembey adası and Aydınli burnu. The holding ground is good and Ekrembey adası affords shelter from south-westerly winds to small craft anchored in the southern corner of the bay, or even to vessels nearer its centre, but the main part of the bay is open westward. The shores of Aydınli limanı are low and on its south-eastern side is a shallow lagoon.

- Kemahli dere (Büyük dere) which flows into the north-western corner of Aydınli limanı, has a shallow bar but is used by small craft; above the bar, it is a mere rivulet.

Aydinbey adası (Mavro island), small, low and covered with trees, is

*Chart 497.*

situated about 2 cables north-westward of Aydınlı burnu. South-eastward of Aydınbey adaası is a shallow inlet which is used by small craft.

The small town of Pendik is situated on the eastern side of a small promontory which projects southward from the coast about  $1\frac{1}{2}$  miles north-westward of Aydınlı burnu. Good anchorage in depths of from 24 to 36 feet (7m3 to 11m0) may be obtained in the roads off Pendik in the north-easterly winds of summer, but not in other circumstances.

The steamer quay and small craft quay are situated near the eastern end of Pendik. A spherical buoy marks a rocky patch close southward of the head of the former quay.

From the promontory southward of Pendik, the coast trends west-north-westward for about  $2\frac{1}{2}$  miles to Chamasır burnu. A jetty, about  $1\frac{1}{2}$  cables long, extends southward from a position about  $1\frac{1}{2}$  miles west-north-westward of Pendik. The town of Kartal, where there is a short pier suitable only for boats, stands on the coast about half a mile eastward of Chamasır burnu ( $40^{\circ} 53' N.$ ,  $29^{\circ} 11' E.$ ), but anchorage off the town is not good.

A jetty, about half a cable long, extends south-south-westward from a position about  $2\frac{1}{2}$  cables north-westward of Chamasır burnu.

*Chart 2286.*

Maltepe burnu ( $40^{\circ} 54' N.$ ,  $29^{\circ} 09' E.$ ) situated about  $1\frac{1}{2}$  miles west-north-westward of Chamasır burnu, is rocky and moderately high. Orhan (Drakos tepe), an isolated, bare and hog-backed hill, 350 feet (106m7) high, is situated about 4 cables northward of Maltepe burnu.

A bank on which the depths are less than 30 feet (9m1) extends about half a mile southward from Maltepe burnu.

For Büyükkada kanalı (Prinkipo channel) and the dangers on its southern side, see pages 144–147, and for the submarine cable between Chamasır burnu and Büyükkada, see page 147.

**Maltepe burnu to Fenerbahçe burnu.—Coast.—Navigational aids.**—From Maltepe burnu the coast trends north-westward for about 3 miles and is low and comparatively straight; thence to Bostancı (Bostanji), about one mile farther north-westward, it is indented by small bights with low, reddish cliffs. Within this stretch of coast the ground slopes gradually upwards to Kayışdağ (Kaish dagh), a treeless but moderately cultivated ridge, 1,400 feet (426m7) high, situated about 3 miles inland.

A pier extends about  $1\frac{1}{2}$  cables from the coast about three-quarters of a mile north-westward of Maltepe burnu. Maltepe light is exhibited, at an elevation of 23 feet (7m0), from a column 13 feet (4m0) in height from the head of the pier.

In 1956, the mast of a wreck was visible in a position 9 cables north-westward of Maltepe Pier light-structure.

The village of Maltepe, in which there is a minaret, is situated on the coast about  $1\frac{1}{2}$  miles north-westward of Maltepe burnu. Abreast this village there is a pier with a depth of 4 feet (1m2) alongside the north-western side of its outer end.

There is a harbour for small craft at Bostancı, sheltered from north-westward and southward by a breakwater. A light is exhibited, at an elevation of 16 feet (4m9), from the head of the breakwater.

Between Bostancı and Fenerbahçe (Fener) burnu ( $40^{\circ} 58' N.$ ,  $29^{\circ} 02' E.$ ) a prominent, flat point, backed with red and white cliffs, 10 feet (3m0) high and covered with trees, about  $2\frac{1}{2}$  miles westward, the coast is indented by small bights, behind which stands the town of Erenköy.

A light is exhibited, at an elevation of 82 feet (25m0), from a white,

*Chart 2286.*

round, stone tower, 66 feet (20m1) in height, situated on the western extremity of Fenerbahçe burnu. A fog signal is sounded from the lighthouse.

- 5 **Compass adjustment beacons.**—Three pairs of beacons for the adjustment of compasses stand near the coast in the following positions: About one mile north-westward of the minaret in Maltepe village; about 4½ cables south-eastward of the same minaret; and about 6 cables eastward of the extremity of Maltepe burnu. Each of these beacons consist of a  
10 white iron framework structure, surmounted by a triangle painted in black and white vertical stripes, point up on the front, and point down on the rear beacon. The northernmost pair of beacons, about 1½ cables apart, are in line bearing 000°; the middle pair, about 5½ cables apart, are in line bearing 045°; and the southernmost pair, about 2 cables apart, are in line  
15 bearing 090°.

- Maltepe bankı.**—**Dangers.**—**Lights.**—Maltepe bankı, an extensive bank of sand and coral on which the depths are less than 30 feet (9m1), fronts the coast between Maltepe village and Bostancı, and extends up to 2 miles offshore westward of Maltepe village. On this bank are four  
20 groups of rocks which somewhat encumber the passage between Kızıl adalar, *see* below, and the coast of the mainland north-westward. Between these groups of rocks and the mainland is a channel about 4 cables wide in which there is a least depth of 24 feet (7m3) in the fairway.

- Dilek kayalığı (Vorthonas), a rock, 3 feet (0m9) high, is situated near  
25 the middle of the outermost group of rocks at the south-western extremity of Maltepe bankı and about midway between Maltepe village and Kınalıada (Proti) (page 146). A short distance westward of Dilek kayalığı, the depths increase abruptly to over 60 feet (18m3). About 2 cables north-eastward of Dilek kayalığı there is a group of rocks one foot (0m3) high,  
30 and depths of less than 18 feet (5m5) extend about half a mile north-eastward of this latter group.

A light is exhibited, at an elevation of 20 feet (6m1), from a white metal column, 20 feet (6m1) in height, situated on Dilek kayalığı.

- Görünmeyen kayalıkla (Batmez Yorthonas), situated about one mile  
35 north-north-eastward of Dilek kayalığı, is 3 feet (0m9) high and is surrounded by a shoal which, with depths of less than 18 feet (5m5), extends about 1½ cables westward, and 1½ cables east-north-eastward from it.

- Yıldız kayalığı (Sıklı Vorthonas), the northern rock, situated about  
40 5 cables north-westward of Görünmeyen kayalıkla, is 3 feet (0m9) high and is fringed by a narrow bank.

A light is exhibited, at an elevation of 15 feet (4m6), from a white metal column situated on Yıldız kayalığı (40° 56' N., 29° 05' E.).

- Anchorage.**—Anchorage can be obtained anywhere between the  
45 coast of the mainland and Kızıl adalar, in depths of from 36 feet to 17 fathoms (11m0 to 31m1), except near the dangers described above and in the vicinity of the submarine cables, *see* page 147.

- KIZIL ADALAR.**—**Dangers.**—**Navigational aids.**—Kızıl adalar (Princes islands) is a group of nine islands, lying from about 2 to 3 miles  
50 south-westward of Maltepe burnu and the coast north-westward of it. They are generally high with cliffs of a bright red and yellow hue, due to the large amount of iron and other minerals in the composition of the rock. The four larger islands are inhabited and contain the summer residences of some of the inhabitants of Istanbul, Büyükkada (Prinkipo)

*Chart 2286.*

being the favourite. The remainder of the group are little more than barren, rocky islets.

Büyükkada, the largest of the group, lies with its northern extremity about  $1\frac{1}{2}$  miles south-south-westward of Maltepe burnu. The island is celebrated for its healthy climate which is doubtless due to the dwarf pines with which a part of it is covered and also to the comparative dryness of the north-easterly wind. 5

Bükükada is high and is divided into two parts by a dip in the hills. The southern and higher part is bare and rocky, and attains an elevation of 655 feet (199m6) with a conspicuous tower on the summit of a hill. A large monastery is situated on the summit of another hill about  $6\frac{1}{2}$  cables eastward of Glossa Kavö, the western point of the island. The town, with its villas standing for the most part in gardens, is situated at the northern end of the island. 10 15

There is a pier abreast a mill on the western coast of the island, about one mile west-south-westward of the town.

Büyükkada bankı (Prinkipo bank), consisting of sand and coral with depths of from 12 to 18 feet (3m7 to 5m5) over it, extends about half a mile northward from the northern end of the island; the ledge of the bank is mostly steep-to. 20

A black and white can light-buoy, fitted with a radar reflector, and exhibiting a *red flashing light every three seconds*, is moored at the northern extremity of Büyükkada bankı.

Sedefadaşı (Andirovitha), 180 feet (54m9) high, lies eastward of Büyükkada from which it is separated by a channel about 6 cables wide with a least depth of 36 feet (11m0) in the fairway over a ridge connecting the two islands. 25

A 27-foot (8m2) patch lies about 2 cables northward of Sedefadaşı which is otherwise moderately steep-to. 30

Balıkçı adası (Niandro), a rocky islet 85 feet (25m9) high, lies about one mile southward of Büyükkada. It is fringed by a rocky flat which, with depths of less than 60 feet (18m3) over it, extends up to one cable off its northern and eastern sides.

Heybeliada (Halki), 445 feet (135m6) high, situated about three-quarters of a mile west-north-westward of the northern part of Büyükkada, and separated from it by Heybeliada kanalı (Halki channel) is moderately steep-to except on its eastern side where a bank on which the depths are less than 18 feet (5m5) extends as much as one cable offshore. There are a number of dwarf pines on Heybeliada, except for which the island is bare and rocky. The town is situated on the eastern side of the island. 35 40

Çam (Cham) limanı, a cove on the southern coast of Heybeliada, affords space for two small vessels to moor in depths of 48 feet (14m6), but is completely open southward.

The buildings of the Turkish Naval College ( $40^{\circ} 52' N.$ ,  $29^{\circ} 06' E.$ ) are situated at the eastern extremity of Heybeliada. On a rounded hill which forms the northern part of the island is a theological college and on the dip of a hill close northward of the head of Çam limanı, is another large building. 45

Close south-eastward of the Naval College there is a small harbour formed by two moles with its entrance, which is about 400 feet (121m9) wide, facing eastward. The northern mole of this harbour is about one cable in length; south-westward of the southern mole the land is being reclaimed. Lights, exhibited at an elevation of 16 feet (4m9), mark the heads of both moles. 50 55

A light is exhibited at an elevation of 98 feet (29m9) from a mast on a

*Chart 2286.*

signal tower, 92 feet (28m0) in height, situated at the eastern end of the Naval College buildings.

A light is exhibited, at an elevation of 16 feet (4m9) from the head of the mole in the boat harbour.

Heybeliada kanalı, between Büyükkada and Heybeliada, is about 5 cables wide between 18-foot (5m5) shorebanks on either side. There is a passage in which the depths in the fairway are 33 feet (10m1), but it is so narrow that, without buoys, vessels cannot be sure of carrying through more than 27 feet (8m2) as there is no leading mark. In the latter depth there is a passage about 3 cables wide, to pass through which it is only necessary to keep in mid-channel.

Burgazadası (Antigone), lying about 4 cables west-north-westward of the southern part of Heybeliada, is 535 feet (163m1) high and moderately steep-to except on its eastern side where a bank on which the depths are less than 18 feet (5m5) extends as much as  $1\frac{1}{2}$  cables offshore. Burgazadası is bare and rocky except for a pine wood which crowns the summit of the island and extends eastward along its southernmost spur. The southern coast of the island consists of a cliff about 500 feet (152m4) high. On the eastern side and close southward of the village, a rough mole projects about one cable from the coast and protects a landing pier from south-westerly gales.

A light is exhibited at an elevation of 13 feet (4m0) from a concrete tower, 10 feet (3m0) in height, situated on some offshore rocks about  $1\frac{1}{2}$  cables south-eastward of the pier on the eastern side of Burgazadası.

Kasık adası (Pita), a bare, rocky islet, 60 feet (18m3) high, situated between the northern parts of Burgazadası and Heybeliada, has a navigable channel on either side of it. Between the southern end of the islet and the rough mole projecting from Burgazadası, the channel is about  $1\frac{1}{2}$  cables wide with a depth of 48 feet (14m6) in the fairway. The other channel, between the eastern side of Kasık adası and Heybeliada, is about  $2\frac{1}{2}$  cables wide, also with a depth of 48 feet (14m6) in the fairway. This latter channel affords capital anchorage with good holding ground of coralline overlying stiff mud; there are three mooring buoys in the eastern part of this channel. Southward of Kasık adası the channel between Burgazadası and Heybeliada is about  $2\frac{1}{2}$  cables wide with depths of 6 fathoms (11m0) in the fairway.

Kınalıada (Proti), 375 feet (114m3) high, situated about one mile north-north-westward of Burgazadası, is completely bare and has a small settlement on it. It is fringed by a flat with depths of less than 18 feet (5m5) over it, which nowhere extends more than  $1\frac{1}{2}$  cables offshore. The channel between Kınalıada and Burgazadası is wide and clear with a least depth of about 17 fathoms (31m1) in the fairway.

A shoal with a depth of 36 feet (11m0) over it, lies about  $4\frac{1}{2}$  cables west-north-westward of the north-western extremity of Kınalıada.

Two islets, Yassiada (Plati) and Sivriada (Oxia), lie about  $2\frac{1}{2}$  miles west-south-westward, and  $3\frac{1}{2}$  miles westward, respectively, of Burgazadası. Yassiada is 150 feet (45m7) high and rocky. It is steep-to except at the eastern end where a flat, with depths of less than 18 feet (5m5) over it, extends about three-quarters of a cable offshore. There is good landing in a camber at the eastern extremity of the islet.

Sivriada, about one mile west-north-westward of Yassiada, is a steep mass of marble, 300 feet (91m4) high. A flat on which the depths vary from 30 to 60 feet (9m1 to 18m3) extends about  $1\frac{1}{2}$  cables from the northern and eastern sides of the islet. Large numbers of seabirds breed on Sivriada.

**Chart 2286.**

A light is exhibited, at an elevation of 313 feet (95m4), from a white conical tower on a concrete base, situated on the summit of Sivriada (40° 52' N., 28° 58' E.).

**Büyükkada kanalı.**—**Directions.**—Büyükkada kanalı, the channel between Büyükkada bankı and the bank extending southward from Maltepe burnu (page 144), is about three-quarters of a mile wide with several 30-foot (9m1) patches in it.

Vessels passing through Büyükkada kanalı should keep the summit of Kasık adası bearing 268° and open northward of Heybeliada, which leads in a least depth of 30 feet (9m1) northward of the light-buoy (page 145) marking the extremity of Büyükkada bankı.

**Submarine cables.**—**Prohibited anchorage.**—Submarine cables, the positions of which are indicated on the chart, have been laid between the islands of Kızıl adalar and the Asiatic mainland.

The landing places of the power cables are each marked by a beacon painted black with a white anchor, crown upwards. At night, the anchor is illuminated by *white* lights. A concrete block is situated about 2 cables off the coast of Büyükkada on either side of the cable to Chamasır burnu.

Vessels are prohibited from anchoring within a distance of one cable on either side of the above submarine cables.

**EASTERN SIDE OF SOUTHERN APPROACH (continued)**—**Fenerbahçe burnu to Moda burnu.**—**Dangers.**—**Navigational aids.**—Fenerbahçe burnu (40° 58' N., 29° 02' E.) and its light are described on pages 143–144.

Kayalı, a rock on which stands a pile of stones 10 feet (3m0) high, lies about 1½ cables south-westward of Fenerbahçe burnu light-structure.

A light is exhibited, at an elevation of 16 feet (4m9) from a white concrete tower 16 feet (4m9), situated on Kayalı.

**Charts 2286, 1198.**

Kalamış koyu (Moda limanı) is entered between the western extremity of Fenerbahçe burnu and Moda burnu, about three-quarters of a mile north-westward. The southern and eastern shores of the bay are low, but Moda burnu and the northern shore consist of cliffs about 50 feet (15m2) high. Kurbagali (Kurbagha) dere flows into the northern corner of the bay. Within Moda burnu and extending northward and eastward from it, is the suburb of Kadıköy.

A mole extends one cable north-eastward from the northern side of Fenerbahçe burnu. A light is exhibited, at an elevation of 16 feet (4m9), from a concrete tower 10 feet (3m0) in height, on the head of the mole.

A sand bank, known as Fenerbahçe bankı (Fener bank), with depths of less than 36 feet (9m1) on it, extends about 1½ miles southward from Moda burnu. This bank has a least depth of 21 feet (6m4) and obstructs, for large vessels, the approach to Kalamış koyu (Kadi kioi). Shoal patches with depths of 28 and 30 feet (8m5 and 9m1) over them, lie westward of the bank, 7 cables south-westward and 6½ cables west-south-westward, respectively, of Moda burnu.

Kızkulesi (41° 01' N., 29° 00' E.) (page 148) bearing 356° in line with the northern end of Haydarpaşa detached breakwater leads westward of Fenerbahçe bankı.

A conical light-buoy, painted red and white in stripes and exhibiting a *red group flashing* light having *two flashes every five seconds*, is moored on the western side of Fenerbahçe bankı, 8 cables westward of Fenerbahçe burnu light-structure.

**Prohibited area.**—**Degaussing range.**—An area into which entry

*Charts 2286, 1198.*

is prohibited and which is indicated on the chart by pecked lines, extends about  $1\frac{1}{2}$  miles westward from Fenerbahçe burnu. Within the area there are two degaussing ranges, each marked by three pairs of white spherical buoys, situated about 2 and 7 cables, respectively, westward of Fenerbahçe burnu. See page 13.

*Chart 1198.*

**Moda burnu to Kızkulesi.—Coast.—Dangers.—Navigational aids.**  
—From Moda burnu to abreast Kızkulesi ( $41^{\circ} 01' N.$ ,  $29^{\circ} 00' E.$ ) about  $2\frac{1}{2}$  miles north-north-westward, the coast is in some parts low and in others, backed by sloping cliffs. Except in the harbour of Haydarpaşa, entered between three-quarters of a mile and  $1\frac{1}{2}$  miles northward of Moda burnu, the coast is fringed by a sunken, rocky flat with detached boulders in places, some of which are above water.

The harbour of Haydarpaşa is described on page 149.

The town of Üsküdar (page 138) is situated on the Asiatic shore of the southern entrance to the Bosphorus, facing the approach to the Golden Horn or Haliç; it is surrounded by numerous gardens and cypresses. The coast abreast the town is fronted by a sand flat which, with depths of less than 30 feet (9m1), extends from about  $1\frac{1}{2}$  to 3 cables offshore.

Kızkulesi stands on the extremity of a rocky ledge situated about one cable westward of the coast at the north-western extremity of Üsküdar. A rock with a depth of less than 6 feet (1m8) over it lies about a quarter of a cable north-north-eastward of Kızkulesi. A 16-foot (4m9) patch lies about one cable south-westward of Kızkulesi.

A conical buoy, painted black above white, with a cone topmark is moored about one cable northward of Kızkulesi.

A conical buoy, painted in red and white bands, with a cone topmark, is moored near the edge of the coastal bank, 2 cables south-south-eastward or Kızkulesi.

A light is exhibited, at an elevation of 31 feet (9m4) from a tripod on a white base 29 feet (8m8) in height situated on Kızkulesi.

The description of the coast northward of Kızkulesi is continued on page 156.

**Prohibited anchorages.**—Anchorage is prohibited in the cable area in the entrance to the strait between İstanbul and Üsküdar, see page 141 and note on chart 1198.

Vessels carrying explosives are prohibited from anchoring northward of the parallel of Haydarpaşa Breakwater south light, see below, and southward of the parallel of Moda burnu. See Caution No. 2 on chart 2286.

**Anchorages.**—There is good anchorage, mostly out of the current, in depths of from 30 to 60 feet (9m1 to 18m3), in an area off the coast between the southern extremity of Fenerbahçe bankı and Kavak burnu, situated about 3 miles northward and close southward of the cable area. Northward of Moda burnu, the anchorage ground is about half a mile wide, but southward of the latter point it narrows considerably; see also the prohibited area, page 147. Abreast this anchorage ground the deep channel leading to the entrance to the strait is narrow and, with the exception of this, vessels can anchor anywhere outside the cable area between İstanbul and Kadıköy. This anchorage ground is, however, but little used, as it is too far leeward with regard to the current for communication with İstanbul.

Northward of the cable area, the holding ground off Üsküdar has been found to be bad between positions about  $4\frac{1}{2}$  cables  $357^{\circ}$  and 7 cables  $025^{\circ}$ , from Kızkulesi ( $41^{\circ} 01' N.$ ,  $29^{\circ} 00' E.$ ).

*Chart 1198.*

**HAYDARPAŞA.** — **General remarks.** — **Facilities.** — Haydarpaşa, about one mile northward of Moda burnu, is the terminus of the İzmit railway which extends to the İstanbul Ferry Vessel quay.

The harbour of Haydarpaşa ( $41^{\circ} 00' N.$ ,  $29^{\circ} 01' E.$ ) which is included within the limits of the port of İstanbul (page 137) is protected from westward by two overlapping detached breakwaters, extending nearly parallel with the coast. The southern entrance, which lies between the southern end of the inner detached breakwater and a short breakwater 8 cables northward of Moda burnu, is only used by small craft and is about  $1\frac{1}{2}$  cables wide. The northern entrance, between the northern end of the outer detached breakwater and a breakwater which extends  $2\frac{1}{2}$  cables north-westward from the shore,  $1\frac{1}{2}$  miles north-north-westward of Moda burnu, is about  $2\frac{1}{2}$  cables wide.

A pilot station is situated on the elbow of the northern detached breakwater.

A mole, on the northern side of which is the Ferry Vessel pier, is situated one cable northward of the southern end of the inner detached breakwater; Galata quay, with a depth of about 21 feet (6m4) alongside, extends about 700 feet (213m4) north-westward from the Ferry Vessel pier. Farther north-westward there is about 4,000 feet (1,219m2) of quayage with depths of 34 feet (10m4) alongside. The quayage extends in the northern part of the harbour, eastward of the northern end of the outer detached breakwater. The quays are connected with the railway system, and two of the quays are fitted with oil pipelines. Galata quay has an elevator at its north-western end.

There are 9 mobile cranes with lifting capacities of up to 5 tons, a fixed 35-ton crane, and a floating sheerlegs of 50 tons capacity.

**Submarine cables.**—Submarine cables are laid between the detached breakwaters, and between the inner detached breakwater and the quays.

**Navigational aids.**—A light is exhibited, at an elevation of 49 feet (14m9), from a white concrete tower, 26 feet (7m9) in height, on the northern end of the outer detached breakwater; a fog signal is sounded from the light-structure. A light is exhibited, at an elevation of 25 feet (7m6), from a similar tower 11 feet (3m4) in height, on the southern end of the breakwater.

A light is exhibited, at an elevation of 48 feet (14m6), from a white concrete tower, 36 feet (11m0) in height, on the south-eastern end of the inner detached breakwater; a fog signal is sounded from the light-structure. A light is exhibited, at an elevation of 25 feet (7m6), from a similar tower 11 feet (3m4) in height, on the north-western end of the breakwater.

Two lights, disposed vertically, are exhibited at an elevation of 26 feet (7m9), from a white iron mast on the head of a breakwater, situated on the southern entrance point of the southern entrance to the harbour.

A light is exhibited from the head of a breakwater situated 4 cables north-north-eastward of the light on the northern end of the outer breakwater and which extends about 2 cables north-westward from Selimiye barracks (page 140). Another mole, on the outer end of which a light is exhibited ( $41^{\circ} 01' N.$ ,  $29^{\circ} 00' E.$ ), is situated about 2 cables north-north-eastward of the breakwater. See Appendix III.

**Regulations.**—See page 152.

*Chart 1198, with plan of Haliç.*

**PORT OF GALATA.**—**Quays.**—The port of Galata (see page 137) extends westward of the Outer port as far as Galata bridge ( $41^{\circ} 00' N.$ ,  $28^{\circ} 58' E.$ ).



*Chart 1198, with plan of Haliç.*

The Galata quays consist of a narrow strip about 2,400 feet (731m6) long, extending from Galata bridge to Tophane landing place, with depths alongside of from 24 to 28 feet (7m3 to 8m5). These quays are chiefly  
 5 used by local vessels and tugs. North-eastward of the Galata quays, there is a further 825 feet (251m5) of quayage with depths alongside of about 16 feet (4m9).

On the southern side of the port between Saray burnu and Galata bridge, there is an almost unbroken line of quayage for about 3,250 feet  
 10 (990m6), with depths alongside of from 20 to 30 feet (6m1 to 9m1).

Galata bridge has two landing places on its eastern side; the Steamer quay is situated on the northern side of the harbour, about half a cable eastward of the root of the bridge. There is a passage 90 feet (27m4) wide through the central sections of this bridge which are movable.

15 Vessels waiting to enter the inner port can make fast to buoys outside Galata bridge between Tophane and Saray burnu. Cargo is transported by lighters.

Small vessels of war moor with their sterns made fast to buoys off the arsenal of Tophane; vessels cannot anchor here as this space is occupied  
 20 by buoys.

The water is quite still in the middle of the port between its entrance and Galata bridge, but the two currents off the northern and southern shores, respectively, produce a zone of eddies which vary every six hours and in which it is impossible for vessels to lie quietly at their anchors;  
 25 these changeable eddies cause much confusion in the anchorage, especially in winter and when under the influence of strong southerly winds, which raise a short, choppy sea.

**Anchorage.**—Anchorage may be obtained in depths of from 17 to 20 fathoms (31m0 to 36m6) in the port of Galata, southward and south-eastward of Tophane, situated about 6 cables northward of Saray burnu.  
 30 A bank extends about half a cable offshore abreast a quay at Tophane but it is marked by piles.

**Regulations for port of Galata.**—See page 153.

**Pilotage.**—See pages 12 and 154.

35 **ISTANBUL INNER PORT.**—The Inner Port (41° 00' N., 28° 58' E.) extends westward of Galata bridge, that part north-westward of Atatürk bridge being known as the Golden Horn or Haliç; see page 137.

Atatürk bridge, about half a mile west-north-westward of Galata bridge, has an opening similar to that of Galata bridge (see above).

40 For submarine cables close to both bridges, see page 154.

The inner port has sufficient depths for vessels of the largest size; quays extend on each side of the harbour, with depths alongside of up to 26 feet (7m9).

The inner part of the Golden Horn, beyond about 1½ miles north-westward of Galata bridge, is shallow.

**Regulations.**—See page 152.

**Pilotage.**—See page 12.

**ISTANBUL.—Landmarks.**—İstanbul (Constantinople) (41° 01' N., 28° 58' E.) is the former capital of Turkey and was the Roman city of  
 50 *Byzantium*, selected by Constantine the Great and became the capital of the Eastern Roman Empire in A.D.364.

It is built on the promontory which forms the western side of the southern entrance to the Bosphorus. It is surrounded by an old wall or

*Chart 1198, with plan of Haliç.*

rampart, flanked by several towers and pierced by many gates. Both the towers and walls are in a ruined state.

The city covers seven hills and the population in 1966, was estimated to be 1,750,600. 5

There are many mosques in the city of which the most remarkable are Ayasofya museum, the former Christian church of Saint Sophia, and the mosque of Sultanahmet, which has six minarets.

At the eastern extremity of the city and facing the strait lies the Old Seraglio. It is of triangular form and surrounded on its southern and 10 western sides by high, grey walls, which join those of the city within which there are many buildings and clumps of cypresses. The railway station lies on the northern side of the Old Seraglio.

Beyoğlu stands on rising ground on the northern side of the Golden Horn, with Galata and Tophane below it on the shores of the strait. The 15 British Consulate General is in the former British Embassy at Beyoğlu.

Galata, southward of Beyoğlu, is the shipping and commercial centre. About halfway up Galata hill is Galata tower, a remarkable white round tower. Tophane lies north-eastward of Galata along the shore of the strait. 20

*Chart 1198.*  
The palace at Dolmabahçe, about  $1\frac{1}{2}$  miles north-north-westward of Saray burnu, was formerly one of the residences of the Sultans. About half a mile south-westward of Dolmabahçe palace and on the shore of the strait near Findikli, there is another old palace.

The coast north-eastward of Dolmabahçe is described on page 156. 25  
*Chart 1198, with plan of Haliç.*

**Port facilities.**—A large stock of coal is maintained. Coal is supplied alongside the quays or in baskets from lighters, at a rate of 170 tons per hour.

There is an oil fuel depot at Selvi burnu, *see* page 158, about  $8\frac{1}{2}$  miles 30 north-eastward of Saray burnu, at which a large stock is maintained; vessels are supplied by pipe-line at the rate of 150 tons per hour or by two 300-ton barges at the rate of 80 tons per hour.

Fresh provisions are plentiful.

Drinking and boiler water can be supplied by hose alongside the quays 35 or by tank vessels; supplies are not available quickly.

Numerous tugs are available and there are two floating fire engines, one stationed outside Galata bridge and the other between Galata and Atatürk bridges.

Large repairs can be undertaken. 40

There are several docks and patent slips in the port; for details of the largest dock, *see* Appendix I.

There is a Municipal hospital in İstanbul and an American hospital in Beyoğlu.

**Trade and shipping.**—The principal exports consist of grain, wool, 45 cotton, dried fruit, mohair, wood, silk, tobacco, attar of roses and carpets, and the chief imports are manufactures of all kinds, coal, iron, lead, copper, tin, earthenware, glass and timber.

**De-ratting.**—De-ratting can be carried out and Deratisation Exemption certificates granted at İstanbul ( $41^{\circ} 01' N.$ ,  $28^{\circ} 58' E.$ ); *see* page 27. 50

**Storm signals.**—Storm signals, *see* page 18, are displayed at the Port Authority building, about one cable eastward of the northern end of Galata bridge.

**National day.**—*See* page 3.

**British Consular Officer.**—A British Consular Officer is stationed at 55 İstanbul.

*Charts 1198, with plan of Haliç.*

**Communications.**—There is frequent sea communications with all the chief ports of the Mediterranean and Marmara denizi. There is railway communication with all parts of Europe by way of Edirne 5 (Adrianople), and from Haydarpaşa on the Asiatic side of the strait, to İzmit, Ankara, Konya, Ereğli and Aleppo.

Power-driven ferry services run from near Galata bridge to Kızıl adalar, to Üsküdar and Kadıköy, to various places on the shores of the strait as far as Büyükdere, and up the Golden Horn as far as Eyüp; see 10 Caution concerning 'Lookout' on page 154.

The caiques which ply for hire in the port rarely carry lights at night. There is an international airport about 7 miles west-south-westward of İstanbul; see page 3.

**Radio station.**—There is a radio station at İstanbul, see page 26.

15 **Climatic table.**—See page 72.

*Charts 2286, 1198.*

**DIRECTIONS FOR APPROACHING THE BOSPORUS FROM SOUTH-WESTWARD.**—Directions for Marmara denizi are given on pages 135 and 136.

20 During daylight, vessels bound for İstanbul generally make a landfall at Yeşilköy burnu ( $40^{\circ} 57' N.$ ,  $28^{\circ} 51' E.$ ) which is low and of a reddish colour and may be identified by the lighthouse and the houses on it. İstanbul is hidden by Yeşilköy burnu to vessels approaching from west-ward. By keeping Yeşilköy burnu light bearing  $070^{\circ}$  or less, vessels 25 will not approach the coast westward of it within a distance of 3 miles.

After passing Yeşilköy burnu, see page 136, to which a berth of one mile should be given, vessels should shape course to pass outside Ahırkapı bankı, and after rounding this bank, they may approach within one cable of the quays, guarding against the set of the current which here runs at a rate 30 of  $4\frac{1}{2}$  knots. Owing to the large number of vessels generally found in this locality, it is preferable to keep the Asiatic shore aboard until abreast Kızkulesi and thence to steer across to the European shore. See remarks on currents, pages 39 to 45, and 'caution' on page 140.

See also Regulations on page 12.

35 **Speed of vessels.**—See page 13.

*Chart 1198.*

**REGULATIONS.** — General regulations for Bosphorus. — See pages 9–13.

**Quarantine and Customs.**—See page 10.

40 **Vessels of war.**—See page 11.

**Pilotage.**—See page 12.

**Navigation in Bosphorus.**—See page 12 and Caution No. 1 on Chart 1198.

**Speed of vessels.**—See page 13.

45 **Tankers and vessels carrying dangerous cargoes.**—See page 13.

**Prohibited areas.**—See pages 141, 147, 148, 156, 160, 161.

**Special regulations for port of Haydarpaşa.**—The following are included among special regulations for the port of Haydarpaşa ( $41^{\circ} 00' N.$ ,  $29^{\circ} 01' E.$ ), copies of which should be obtained from the Port Authority:

- 50 (i) Vessels must inform the harbour authorities of their expected arrival at least 24 hours beforehand.
- (ii) No vessels are permitted to anchor in the harbour area.
- (iii) No vessel laden with explosives or inflammable material is permitted in the harbour.

*Chart 1198.*

- (iv) All vessels in harbour must keep sufficient crew on board to enable the vessel to be moved at any time.

*Chart 1198, with plan of Haliç, 2286.*

**Special regulations for the port of İstanbul.**—A copy of the regulations for the Port of İstanbul should be obtained from the Port Authority. The following are some of the extracts from the 1966 Edition:

- (i) **Pilotage.**—*See* page 12.
- (ii) **Speed.**—Power driven vessels in Galata harbour or Inner harbour must proceed at slowest speed consistent with safe navigation, but must never exceed 10 knots.
- (iii) **Anchorage.**—Vessels may anchor, without previous authorisation, in either of the undermentioned localities in the outer port, provided that they do not obstruct the traffic:—
- (a) Southward of the cable area. *See* page 148.
- (b) Between a line drawn in a 165° direction from Tellitabya burnu (page 160) to the opposite shore of the strait and a line joining the light-buoy off Yeniköy, *see* page 158, and Paşabahçe, *see* page 158 and Caution No. 7 on Chart 1198.

Vessels should, however, as soon as possible after they have anchored, inform the port authority of the place of anchorage.

With the exception of the anchorages mentioned above, no vessel is permitted to anchor anywhere in the port, to enter the port of Galata, to go alongside the quays, or to make fast to the buoys, until her captain or agent has obtained permission and the necessary instructions from the Captain of the port.

Vessels laden with explosives or inflammables must not anchor northward of the parallel of Haydarpaşa Breakwater south light and southward of the parallel of Moda burnu. *See* page 148. All vessels so laden must display a red flag during the day and exhibit a red light at night.

An anchorage for temporary use, known as Emergency anchorage T and indicated on the chart by pecked lines, is situated off the north-western shore of the strait between Kabataş scala, about one mile north-north-eastward of Saray burnu and Ortaköy (41° 03' N., 29° 01' E.), about 1½ miles farther east-north-eastward. Except in a foul area, situated southward of the palace at Dolmabahçe and indicated on the chart by dotted lines, there is anchorage in depths of from 15 to 20 fathoms (27m4 to 36m6) in this area. Vessels passing through the port and finding it necessary to stop for provisions, or on account of bad weather, repairs to machinery, etc., should anchor in this area. *See* Cautions Nos. 2 and 8 on chart 1198. There are some mooring buoys in this area.

Care should be taken not to anchor near the line where the main current and counter-current meet, as they produce violent eddies which sheer vessels in all directions and may cause vessels anchored too close together to collide. Though the boundary line which separates the permanent current from the eddies is easy to perceive on the surface of the water, it alters its position from hour to hour and, if the anchorage is crowded, it is sometimes very difficult to avoid anchoring near the dividing line. Vessels bringing up in the strait should therefore always moor. The holding ground is mud.

Care should be taken with the cables both in anchoring and getting under way, as there are many lost anchors on the bottom. Vessels are constantly running into or drifting on one another; a sharp look-out should be kept therefore in squally weather, especially on the smaller craft, which seem always to be at a short stay.

*Chart 1198, with plan of Haliç, 2286.*

For anchorages in the southern part of the port southward of the cable area, *see* pages 140 and 142.

Only vessels not exceeding 500 gross tons are allowed to anchor in 5 Arnavutköy bight ( $41^{\circ} 04' N.$ ,  $29^{\circ} 03' E.$ ). Anchoring with the stern secured to the shore is not permitted; *see* Caution No. 3 on chart 1198.

Anchorage is prohibited in Istinye koyu (page 157) except for vessels awaiting repair; *see* Caution No. 4 on chart 1198.

Berths are reserved for sports and excursion craft in Tarabya koyu 10 (page 159); *see* Caution No. 5 on chart 1198.

(iv) *Entry to Galata.*—Vessels exceeding 3,000 gross tons register, if proceeding through the bridges, must have at least one tug.

Sailing vessels of more than 50 tons must take a tug into the port of Galata; *see* page 12 for pilotage.

15 (v) *Entry to Golden Horn.*—Vessels are required to give 12 hours notice for entering or leaving Golden Horn.

The bridges at the entrance to Golden Horn are open for about one hour daily, the times depending upon the month of the year.

(vi) *Movement of small craft.*—Movement of small craft is pro- 20 hibited in the area between a line joining Saray burnu and Kabataş scala, and Galata bridge, between 0830 and 0930 and between 1730 and 1830.

*Prohibited landing.*—Landing is prohibited northward and eastward of the dotted line indicated on the charts, extending in a  $343^{\circ}$  direction from Selvi burnu (page 160) to the opposite shore of the strait. *See* Cautions 25 No. 6 on Chart 1198 and No. 1 on Chart 2401. This caution does not apply to the landing stage at Anadolukavağı, *see* page 10.

(vii) *Submarine cables.*—The landing places of submarine cables are marked by square beacons, painted black with white anchors, crown up, on them, the anchors usually being illuminated at night. Vessels should 30 not anchor within a distance of one cable of any submarine cable so distinguished. *See* Note on Chart 1198.

Submarine telephone cables are laid across the Golden Horn, close alongside Galata bridge and about half a cable north-westward of Atatürk bridge. *See* page 150.

35 Several submarine cables are laid across the strait from Arnavutköy (page 156) to Mehmetçik burnu, on the eastern side of the strait about half a mile east-south-eastward, and from Kandilli (page 156) to the opposite shore north-north-westward of it. A submarine cable is laid across the strait from Balta limanı, about  $1\frac{1}{2}$  miles northward of Kandilli, 40 to the southern side of Kanlıca koyu, a small inlet situated on the opposite shore south-eastward.

Another cable crosses from Aşıyan burnu (page 156) to Anadoluhisarı, on the opposite side of the strait eastward of it. Anchorage is prohibited in the vicinity of these cables in an area indicated on the chart by pecked 54 lines.

A submarine power cable and two protecting cables cross the strait from Selvi burnu (page 159) to Naletburun, situated about 6 cables south-westward of it. Anchorage is prohibited in the vicinity of these cables, the routes of which are indicated on the chart.

50 Submarine cables cross the strait between Rumelikavağı (Rumili Kavak) (page 161) and Anadolukavağı (Anatoli Kavak), about three-quarters of a mile south-eastward of it. Anchorage is prohibited in the vicinity of these cables.

(viii) *Lookout.*—Vessels should keep a good lookout for the continuous 55 ferry and small passenger craft traffic across the Bosphorus and avoid navigation in foggy or bad weather,

*Chart 1198, with plan of Haliç, 2286.*

(ix) **Noise.**—Vessels may not carry out noisy repair operations inside the harbour, except in dockyards, repair yards and free anchorages.

Except when entering or leaving harbour vessels may not broadcast loud music on loudspeakers.

The use of ship's syrens is to be reduced to a minimum, and motor craft must be fitted with silencers.

(x) **Diving.**—Diving is not permitted in the harbour without prior permission of the Port Authority.

*Chart 1198.*

**THE BOSPORUS OR İSTANBUL BOĞAZI.—General remarks.—**

The Bosphorus or İstanbul boğazi, also known as Karadeniz boğazi, leads from Marmara denizi to the Black sea, and is administratively included in the Port of İstanbul; *see* page 137. The southern limit to the strait may be said to be a line joining Saray burnu (page 140) and Kızkulesi (page 148) ( $41^{\circ} 01' N.$ ,  $29^{\circ} 00' E.$ ) at the entrance from Marmara denizi, and the northern limit, a line joining the two capes on which stands the lighthouses of Rumeli and Anadolu, on the western and eastern sides, respectively, of its entrance from the Black sea.

Like the Dardanelles, this strait resembles a river with abrupt and angular windings. The projecting points deflect the current, affording shelter from it under their lee. The depths in the fairway are considerable.

Both sides are covered with houses and many fine buildings. The western side is built over throughout its length, but on the eastern side the buildings are more scattered, and are everywhere backed by hills covered with rich vegetation.

In proceeding northward through the strait, vessels will generally have to contend with both the wind and current, since the prevailing winds are north-easterly and the main current invariably sets southward. There are, however, many good anchorages.

There are but few dangers in the strait, and passage through it during daylight presents few difficulties, but no stranger should attempt to navigate it by night. *See* pages 12, 152, 162.

**Regulations.**—*See* page 152.

**Caution.**—The buoys are not to be depended upon.

*Charts 2286, 1198, 3930.*

**Salvage.**—Two salvage vessels are stationed in the strait, one in the southern and the other in the northern part.

**Currents.**—*See* pages 39-48.

**Winds and weather.**—Winds from between north and north-east are the most common, but winds from between south and south-west occur frequently in some years between October and March, and the latter, when strong, often bring rain and squally weather.

It sometimes blows from south-west in the southern part and from north-east in the northern part, with calm weather between Arnavut burnu and Selvi burnu, and if the north-east wind is rather strong it is likely to displace the south-west wind.

At other times south-westerly winds are strong at Büyükdere ( $41^{\circ} 10' N.$ ,  $29^{\circ} 03' E.$ ) and in the northern part of the strait but are hardly felt at İstanbul, or only reach there several hours later. It has been reported that on these occasions the wind is generally south-easterly in the Black sea.

In summer, winds very seldom blow across the strait, but may occasionally do so at one or other of the entrances.

*Chart 1198.*

**Kizkulesi to Istinye koyu.—Dangers.—Lights.—Anchorages.—Prohibited anchorage.**—From abreast Kizkulesi ( $41^{\circ} 01' N.$ ,  $29^{\circ} 00' E.$ ) (page 148) the eastern side of the strait trends north-eastward for about 3 miles and thence northward for one mile and is bold and steep-to, as far as Kandilli burnu, near which is the village of Kandilli. Near the coast, about 2 miles north-eastward of Kizkulesi is the marble palace of Beylerbeyi. There is a depth of 9 feet (2m7) close offshore abreast this palace.

- 10 A light is exhibited at an elevation of 33 feet (10m1) from a white metal post 3 feet (0m9) in height, on the wall of the palace at Beylerbeyi.

A light is exhibited, at an elevation of 90 feet (27m4) from a white, metal column 30 feet (9m1) in height, situated on Kandilli burnu.

- On the western side of the strait, from the palace at Dolmabahçe (page 151), the coast trends east-north-eastward for about  $1\frac{1}{2}$  miles to Defterdar burnu and is steep-to. The marble palace of Çırağan stands on the shore about three-quarters of a mile east-north-eastward of the palace at Dolmabahçe. A spit projects about 30 yards (27m4) off the point at Ortaköy, about  $3\frac{1}{2}$  cables south-westward of Defterdar burnu; the former point is easily identified by a white mosque which stands on it.

From Defterdar burnu the western shore of the strait trends north-north-eastward for about  $1\frac{1}{2}$  miles to Akıntı burnu, inshore of which is the village of Arnavutköy.

- Kuruçeşme bankı lies about half a cable offshore, about  $4\frac{1}{2}$  cables north-north-eastward of Defterdar burnu.

A light is exhibited, at an elevation of 23 feet (7m0) from a metal tripod, painted black and white in bands and surmounted by a black cone, 23 feet (7m0) in height, situated on Kuruçeşme bankı ( $41^{\circ} 03' N.$ ,  $29^{\circ} 02' E.$ ).

- 30 Galatasaray ada, part of which is above water, lies abreast the village of Kuruçeşme, about one cable offshore and about  $3\frac{1}{2}$  cables north-north-eastward of Kuruçeşme light. There are depths of from 42 feet to 12 fathoms (12m8 to 21m9) in the channel between Galatasaray ada and the quays on shore westward, and there is shelter here from northerly winds.
- 35 This channel can be used by vessels proceeding to the quays but anchorage therein is prohibited because of a submarine cable which runs from Galatasaray ada to the mainland westward. Vessels proceeding through the Bosphorus should keep eastward of this bank.

- The anchorage south-westward of Akıntı burnu, in Arnavutköy bight is reserved for vessels up to 500 tons gross. Anchoring with stern secured to the shore is not permitted: see Caution 3 on chart No. 1198.

A light is exhibited, at an elevation of 36 feet (11m0) from a white metal mast 30 feet (9m1) in height, situated one cable south-westward of Akıntı burnu.

- 45 Overhead cable; see page 157.

- Bebek koyu, on the western side of the strait, is entered between Akıntı burnu and Aşiyan burnu, about one mile north-north-eastward. This bay is obstructed by a spit which, with depths of less than 6 feet (1m8) on it, extends about  $2\frac{1}{2}$  cables north-north-eastward from the south-western side of the bay and terminates in a point about one cable eastward of Bebek quay, situated at the head of the bay. The current does not enter Bebek koyu.

- Bebek light ( $41^{\circ} 04' N.$ ,  $29^{\circ} 03' E.$ ) is exhibited, at an elevation of 15 feet (4m6) from a black, stone, pyramidal structure, 15 feet (4m6) in height, situated at the north-eastern extremity of the spit.

Three lights have been established to mark a boat passage to Bebek

*Chart 1198.*

quay. Each of these lights is exhibited, at an elevation of 10 feet (3m0), from a red and black concrete column, situated, respectively, about 1½ cables south-south-westward, and 1½ and 1½ cables south-westward of the light-structure on the extremity of the spit in Bebek liman. 5

Aşıyan burnu rises to a hill on which stands the village of Rumelihisari and an old castle, about 4 cables north-westward of the point; Anadoluhisari lies opposite Aşıyan burnu on the eastern side of the strait.

Rumelihisari light is exhibited, at an elevation of 23 feet (7m0), from a white, metal framework tower, 56 feet (17m1) in height, situated on the head of a quay close northward of Aşıyan burnu. 10

On the eastern side of the strait between Kandilli and Anadoluhisar, about three-quarters of a mile farther north-eastward, the coast forms a bight. The shores of this bight are steep-to except off Anadoluhisar where a bank, with a depth of 9 feet (2m7) over it, extends about half a cable off the mouth of Göksu dere, a small stream which flows through a valley southward of Anadoluhisar. The outer edge of this bank is marked by a black and white conical buoy, with a black cone topmark, moored in a depth of 24 feet (7m3). There is an old Genoese castle at Anadoluhisar. 15

From the old castle at Anadoluhisar, the eastern side of the strait trends northward for about 1½ miles to a point on which stands Kanlıca light-structure. The village of Kanlıca is situated on the coast about 2 cables southward of this point. 20

Kanlıca light is exhibited, at an elevation of 82 feet (25m0), from a white, metal tower 33 feet (10m1) in height, situated on the point about 2 cables northward of Kanlıca village. 25

Çakal burnu (41° 06' N., 29° 04' E.) is situated about 3½ cables north-eastward of Kanlıca light, whence the eastern side of the strait trends eastward and north-eastward for about one mile to the southern entrance point of İncir (Injir) liman forming Çubuklu liman which is deep and open north-westward. 30

From Aşıyan burnu, the western side of the strait trends northward for about 1½ miles to Tokmak burnu, the southern entrance point of İstinye koyu.

**Submarine cables.**—For submarine cables in the area between Kizkulesi and İstinye koyu, *see* page 154. 35

**Overhead power cable.**—**Lights.**—An overhead power cable suspended between two pylons, indicated on the chart, crosses the strait southward of Kandilli, from a position about 2½ cables northward of Akıntı burnu (*see* above). The cable has a minimum clearance of 225 feet (68m6), but mariners are advised that the maximum height of any part of a vessel passing under the cable should not exceed 216 feet (65m8). 40

Both pylons are iron framework structures and are painted white with yellow bands; the western pylon has an elevation of 637 feet (194m2), the eastern pylon 633 feet (192m9). An intensified *red flashing* obstruction light is exhibited from the top of each pylon, and four *red fixed* obstruction lights, disposed vertically, are exhibited at lower elevations. 45

**İstinye koyu to Selvi burnu.**—**Light-buoy.**—**Dangers.**—**Anchorages.**—İstinye koyu is entered between Tokmak burnu (41° 07' N., 29° 03' E.) and a point about 3 cables farther north-north-eastward. It is sheltered from all winds and currents. The buildings of Yeniköy extend north-north-eastward along the coast from the northern entrance point of İstinye koyu. 50

A bank, with depths of less than 18 feet (5m5) over it, extends up to one cable offshore in places between the northern entrance point of İstinye koyu and a position about one mile north-north-eastward. That 55



*Chart 1198.*

part of the bank abreast K ybaşı burnu ( $41^{\circ} 07' N.$ ,  $29^{\circ} 04' E.$ ), a point about 7 cables north-eastward of the northern entrance point of İstinye koyu, is known as Yenik y bankı. Rumelihisarı light-structure bearing  
 5  $200^{\circ}$  and in line with the western extremity of the eastern shore of the strait close to Kanlıca, leads eastward of this bank.

A floating dock is moored in İstinye koyu, *see* Appendix I and Caution No. 4 on chart 1198.

A black can light-buoy, fitted with a radar reflector, and exhibiting a  
 10 *green flashing light every three seconds*, is moored close off the eastern extremity of Yenik y bankı.

Paşabah e Koyu (Injir bay) and Beykoz liman (Beikos bay), situated on the eastern side of the strait, between one and two miles north-north-eastward of Kanlıca light-structure, afford safe anchorage for a con-  
 15 siderable number of vessels sheltered from the main current which is diverted, forming a zone of eddies within about 4 cables of the shores of these bays.

Paşabah e koyu, the southern bay, lies eastward of and opposite K ybaşı. This bay is much obstructed by İncirk ybankı (Injir reef), a  
 20 mud flat with an outer edge of mud and gravel, with depths of from 9 to 15 feet ( $2m7$  to  $4m6$ ) on it, which extends about 3 cables from the head of the bay, about  $1\frac{1}{2}$  miles north-eastward of Kanlıca light-structure. There is an oil depot with four piers, situated about half a mile south-westward of İncirk y, which stands at the south-eastern corner of Paşabah e koyu.  
 25 Beykoz liman is entered south-eastward of Hunkar (Hunkiar) iskelesi, on which stands Hunkar k sk  (Sultan's kiosk), about one mile north-north-eastward of K ybaşı.

There are numerous landing-places on the shores of both Paşabah e koyu and Beykoz liman, and there are piers for ferry vessels at Paşabah e  
 30 (Pasha bagche), near İncirk y, and at Beykoz (Beikos), near the north-eastern corner of Beykoz liman. There is a depth of 15 feet ( $4m6$ ) alongside Paşabah e Ferry pier.

Two rows of mooring buoys, with 3 buoys in each row, lie between  $2\frac{1}{2}$  cables southward and 5 cables south-south-eastward of Hunkar iskelesi.  
 35 Between Hunkar iskelesi and Selvi burnu about 4 cables north-westward, there is a bight, into the head of which flows S l khane dere (Sultan's valley); this river descends through a valley in which are numerous trees. A small pier, at which boats can land, is situated about three-quarters of a cable north-north-westward of Hunkar iskelesi.  
 40 A coastal bank, on which the depths are less than 18 feet ( $5m5$ ), extends about three-quarters of a cable off the shores of this bight, and there is a 9-foot ( $2m7$ ) rock near its outer edge, about 3 cables east-south-eastward of Selvi burnu. The nature of the bottom off the entrance to the bight is mud mixed with sand.

45 A mooring buoy lies  $1\frac{1}{2}$  cables south-eastward of Selvi burnu.

There is an oil fuel depot at Selvi burnu ( $41^{\circ} 08' N.$ ,  $29^{\circ} 04' E.$ ) and a mooring buoy is moored northward of the point. Vessels of a draught up to 24 feet ( $7m3$ ) or, if breasted off by lighters, up to 36 feet ( $11m0$ ), can berth alongside the depot and embark oil fuel. *See* page 151.

50 The anchorage in Beykoz liman is generally preferred to that in Paşabah e koyu on account of İncirk ybankı. The holding ground is good throughout Beykoz liman but vessels should moor as taut as practicable and attention is necessary to keep a clear hawse. The best anchorage found in Beykoz liman by H.M.S. *Lucia*, from October to December,  
 55 1922, was in 36 fathoms ( $65m8$ ), off Karaca (Karaja) burnu, about  $11\frac{1}{2}$  cables south-eastward of Selvi burnu. In this position, with the prevailing north-

*Chart 1198.*

easterly wind, the vessel lay head to wind and was out of the current, and with south-westerly winds she was in the direct stream of the north-east-going eddy, and lay moderately steady under most conditions. Anchorage north-westward or south-eastward of this position was found 5  
very unsuitable during south-westerly winds, on account of strong eddies.

The most sheltered anchorage off the mouth of Sülükhane dere is with Selvi burnu bearing  $323^{\circ}$ , distant  $2\frac{1}{2}$  cables.

Tarabya koyu, on the western side of the strait, is entered between a small mole, situated about one mile north-westward of Köybaşı, and 10  
Tarabya burnu about  $1\frac{1}{2}$  cables farther north-north-westward. The bay affords shelter from all winds but it is small and can only accommodate a few vessels which usually secure alongside the quays. It is reserved for sports and excursion craft; see Caution No. 5 on chart 1198.

A rock, with a depth of less than 6 feet (1m8) over it, lies close off the mole at the southern entrance point, and a bank, on which the depths are 15  
less than 18 feet (5m5), extends a short distance off the southern side of the bay. The current is only slightly felt in Tarabya koyu but it sets towards the sunken rock mentioned above, and vessels entering the bay should hug the northern side. 20

**Submarine cables.**—For submarine cables between Selvi burnu and Naletburun, see page 154.

**Büyükdere limanı.**—**Light.**—**Dangers.**—**Anchorage.**—Büyükdere limanı, on the western side of the strait, is entered between Kireç burnu, situated about 6 cables north-westward of the northern entrance point 25  
of Tarabya koyu, and Mesar burnu, about  $1\frac{1}{2}$  miles farther north-north-eastward near the foot of a valley. This bay affords shelter in all winds and is the best anchorage in the strait. The town of Büyükdere occupies the northern shore of the bay and the village of Kefeliköy is situated near the southern part of its head. 30

A pier with a shelter on its outer end, situated a short distance westward of Kireç burnu, is a good mark. A minaret and some houses are situated at the head of the bay, close northward of a landing pier.

Kireç Burnu light is exhibited, at an elevation of 26 feet (7m9), from a white metal column on a building, 21 feet (6m4) in height, situated 35  
about  $1\frac{1}{2}$  cables east-south-eastward of Kireç burnu.

A 30-foot (9m1) patch lies about  $2\frac{1}{2}$  cables off the northern shore of the bay and about 6 cables north-north-westward of Kireç burnu, and a bank with depths of less than 18 feet (5m5) on it extends up to  $1\frac{1}{2}$  cables 40  
off the southern shore, and about half a cable off the northern shore of the bay. Mesar burnu ( $41^{\circ} 10' N.$ ,  $29^{\circ} 03' E.$ ) is fringed by a bank which, with depths of less than 18 feet (5m5), extends about half a cable offshore.

Anchorage may be obtained in any part of Büyükdere limanı in from about 18 to 24 fathoms (32m9 to 43m9) at its entrance, to from 24 to 42 feet (7m3 to 12m8) near its head; the nature of the bottom is mud and 45  
fine sand. The best and most convenient anchorage is, in depths of about 42 feet (12m8), with the minaret near the head of the bay bearing  $278^{\circ}$ , distant about 3 cables. Vessels may often find so many other vessels anchored in this bay that a convenient berth cannot be obtained.

There are numerous mooring buoys in Büyükdere limanı. 50

**Quarantine.**—Vessels from the Black sea are required to stop at Büyükdere to obtain pratique, see page 10. There are two quarantine anchorages in Büyükdere limanı, for large and small vessels, respectively; the limits of these anchorages are indicated on the chart by pecked lines.

**Storm signals.**—Storm signals, see page 18, are displayed at the Port 55  
office at Mesar burnu.

*Chart 1198.***De-ratting.**—See page 27.

**Umuryeri liman.**—**Dangers.**—**Buoyage.**—Umuryeri (Umur) liman, on the eastern side of the strait, is entered between Selvi burnu and Acar  
5 (Mujue) burnu, about  $1\frac{1}{2}$  miles northward.

Umur bankı are two banks, the southern of which is named Selvi bank, which lie off the entrance to Umuryeri liman. They are composed of sand, gravel and stones, with depths of less than 18 feet (5m5) over them, and are often marked by discolouration; the least depth is one foot (0m3),  
10 situated near the southern end of Selvi bank. These banks are somewhat dangerous as the current sets across them from the direction of Mesar burnu. The two banks are separated by a channel with depths of 42 feet (12m8), but it should not be used as the current sets across it.

An 18-foot (5m5) patch lies about 3 cables south-westward of Acar burnu.  
15 A light-buoy, with a framework structure on a black can base, exhibiting a *white group flashing* light showing *two flashes every five seconds*, is moored on the western side of Selvi bank,  $4\frac{1}{2}$  cables north-westward of Selvi burnu.

Three white conical buoys are moored near the southern extremity of  
20 Selvi bank.

A red light-buoy, fitted with a radar reflector, and exhibiting a *red flashing* light *every three seconds*, is moored off the south-western end of the northern Umur bank: this buoy is not to be relied upon.

A spherical light-buoy, painted black with a white band, fitted with a  
25 radar reflector, and exhibiting a *red group-flashing* light showing *two flashes every five seconds*, is moored about  $3\frac{1}{2}$  cables north-westward of Acar burnu.

Hünkar köşkuf bearing  $117^\circ$  and open south-westward of Selvi burnu leads southward of Umur bankı; *note C* on chart 1198.

30 A farmhouse on the summit of a distant ridge bearing about  $017^\circ$  and in line with the pilot station on Tellitabya burnu, *see below*, leads westward of Umur bankı. *See view B* on chart 2401 and *note B* on chart 1198.

A tree near a house just open of Calılık tepe leads eastward of Umur bankı: *see note A* on chart 1198, and *view A* on chart 2401.

35 **Anchorage.**—Umuryeri liman affords excellent anchorage, in depths of about 60 feet (10m3) mud, about  $1\frac{1}{2}$  cables offshore. A slight eddy prevails at this anchorage.

**Prohibited landing area.**—For the area in which landing is prohibited, *see page 154*.

40 **Mesar burnu to Kavak burnu.**—**Anchorage.**—**Lights.**—**Danger.**

—**Buoy.**—On the western side of the strait the village of Sariyer stands on the shore of a slight bight, about  $6\frac{1}{2}$  cables northward of Mesar burnu.

From Sariyer the coast trends east-north-eastward for about 8 cables to Tellitabya burnu, a point on which is a ruined fort and a conspicuous  
45 yellow house.

Anchorage, clear of the main current, may be obtained in the slight bight between Mesar burnu and Tellitabya burnu, in depths of from 60 feet to 20 fathoms (18m8 to 36m6).

The village of Rumelikavağı ( $41^\circ 11' N.$ ,  $29^\circ 04' E.$ ) lies in a valley  
50 close within the coast about half a mile westward of Tellitabya burnu.

Dikülükaya lie about 2 cables off the western side of the strait eastward of Rumelikavağı. Some of these rocks are almost awash and others are marked by breakers in bad weather. A 7-foot (2m1) shoal lies in the channel between these rocks and the coast westward. A light is exhibited,  
55 at an elevation of 18 feet (5m5), from a white concrete tower, 15 feet (4m6) in height, situated near the centre of these rocks.

*Chart 1198.*

On the eastern side of the strait, Acartabya stands about 4 cables north-north-eastward of Acar burnu. About half a mile south-eastward of this fort is Yuşa Camişi, a round hill, 659 feet (200m9) high, which is a good mark for vessels approaching the northern entrance to the Bosphorus. The slopes of Yuşa Camişi are covered with vegetation and on its summit is a large white building and a minaret. 5

Macar koyu is entered between Acartabya and Kavak burnu, about  $8\frac{1}{2}$  cables north-eastward. The shores of this bight are high and steep-to, and near its head is the village of Anadolukavağı. Kavak battery stands on Kavak burnu facing another battery in the village of Rumelikavağı on the opposite side of the strait. About 3 cables within Kavak burnu are the ruins of an Old Genoese castle. 10

Anadolukavağı light is exhibited, at an elevation of 52 feet (15m8), from a white column, 17 feet (5m2) in height, situated on Kavak battery. 15

Macar bankı, with a least depth of 5 feet (1m5) over it and steep-to, lies about  $1\frac{1}{2}$  cables north-eastward of Acartabya.

**Cautions.**—Vessels are cautioned not to anchor or fish northward of a line drawn in a  $165^\circ$  direction from Tellitabya burnu ( $41^\circ 10' N.$ ,  $29^\circ 04' E.$ ); see page 153 and Caution No. 7 on chart 1198. 20

Units of the U.S.S.R. Black Sea fleet carry out mine-laying exercises in an area with a radius of 20 miles from the northern entrance of the Bosphorus.

**Submarine cables.**—For submarine cables between Rumelikavağı and Anadolukavağı, see page 154. 25

**Kavak burnu to Rumeli lighthouse.**—**Navigational aids.**—**Signal stations.**—Keçilik liman, on the eastern side of the strait, is entered between Kavak burnu ( $41^\circ 11' N.$ ,  $29^\circ 05' E.$ ) and Fil burnu, about 2 miles north-eastward; there is a battery on a hill within Fil burnu. The shores of Keçilik liman are steep-to except between about half a mile eastward of Kavak burnu where a bank, with depths of less than 18 feet (5m5) on it, extends about one cable offshore. 30

Mooring buoys are laid about 3 and 9 cables south-south-westward of Fil burnu.

Between Fil burnu and Poyraz burnu, a point about 6 cables north-eastward, on which stands an old stone fort, the coast forms a bight; a bank, with depths of less than 18 feet (5m5) on it, extends about  $1\frac{1}{2}$  cables from the shores of this bight. 35

Between Poyraz burnu and a point on which Anadolu lighthouse ( $41^\circ 13' N.$ ,  $29^\circ 09' E.$ ) is situated about one mile east-north-eastward, the coast is fringed by above-water and sunken rocks lying close inshore. Anadolu lighthouse is built on elevated ground and vessels approaching from the Black sea may identify it by a wall running down from it; by the town being lower than that of Rumeli lighthouse, situated opposite it on the western side of the strait; and by a large, white building, situated on a high hill south-eastward of it. There is an old fort at the foot of the lighthouse. 40 45

Anadolu light is exhibited, at an elevation of 246 feet (75m0), from a white, stone tower and dwelling, 61 feet (18m6) in height, situated on the point at the eastern side of the northern entrance to the Bosphorus. A fog signal is sounded at the extremity of Yom burnu, about three-quarters of a mile east-north-eastward of Anadolu lighthouse, see also page 164. 50

There is a signal station at the lighthouse. There are depths of from 30 feet to 12 fathoms (9m1 to 21m9) about 2 cables off the coast between Poyraz burnu and Anadolu lighthouse. 55

Between Rumelikavağı and the south-western entrance point of

*Chart 1198.*

Büyük liman, about 1½ miles north-eastward, the western side of the strait is fringed by a bank with depths of less than 18 feet (5m5) on it, on which there are some above-water rocks close inshore, and which  
 5 extends about three-quarters of a cable offshore. The remains of an old Genoese castle stands on a hill about half a mile northward of Rumelikavağı.

Büyük liman is entered between Karatas burnu and Çalı burnu, about 3 cables east-north-eastward; a signal station, consisting of a prominent white building with a flagstaff close to it, stands on Çalı  
 10 burnu. This bay is obstructed by a bank which, with depths of less than 18 feet (5m5) over it, extends about three-quarters of a cable south-eastward of a line joining its entrance points.

There is a mooring buoy in the bay.

A light is exhibited, at an elevation of 108 feet (32m9), from a white  
 15 metal framework tower, 20 feet (6m1) in height, situated on the southern entrance point of Hamsi liman (41° 12' N., 29° 06' E.) about one cable north-eastward of Çalı burnu.

From Çalı burnu, the western side of the strait trends north-north-eastward for about half a mile to Garipçe burnu, on which there is an  
 20 old stone castle. There is a fort, round which there are some houses, on a hill facing north-eastward within the castle.

Northward of Garipçe burnu there is a bight open north-eastward and fringed by a shallow bank.

There is a small battery on a hill of moderate elevation within Paşa  
 25 burnu, situated about one mile northward of Garipçe burnu.

Rumeli lighthouse, about 4 cables northward of Paşa burnu, is situated on a rocky promontory on which stands a village. A group of tall trees stands northward of the lighthouse and serves as a daymark for vessels making the strait. The promontory (41° 14' N., 29° 07' E.) is fringed  
 30 by high rocks with steep faces, and foul ground extends about 1½ cables eastward from the cape.

Rokettaşı, an islet connected to the shore westward by a causeway, and on which stands a beacon, lies about one cable eastward of the cape.

A ruined castle stands about a quarter of a mile north-westward of the  
 35 lighthouse.

Rumeli Burnu light is exhibited, at an elevation of 190 feet (57m1), from a white, circular, stone tower, consisting of two towers of different diameters, one above the other, 99 feet (30m2) in height. A fog signal is sounded from the foot of the lighthouse and a radio beacon transmits  
 40 from a position about 2 cables north-north-westward of it: *red fixed* obstruction lights are exhibited on the radio mast.

**DIRECTIONS.**—See Regulations on pages 9–13 and 152.

In rounding the point at Kandilli (41° 04½' N., 29° 03' E.) it should be given a berth of at least half a cable, and attention should be given to  
 45 the course when the current strikes the starboard bow. Care should be taken to avoid the bank off the mouth of Göksu dere (page 157) by keeping more than one cable off the eastern side in the vicinity of Anadoluhisarı.

To avoid Yeniköy bankı, when northward of Kanlıca light-structure a vessel should bring Rumelihisarı light-structure in line astern with the  
 45 western extremity of the eastern side in the vicinity of the former light-structure, bearing 200°.

Vessels with local knowledge, proceeding northward, frequently pass eastward of Umur bankı as this not only shortens the distance, but the current is always weaker in Umuryeri liman than in the main channel,  
 55 and also close inshore they will be assisted by the counter-current. Caution

*Chart 1198.*

is necessary, however, if Umuryeri liman is encumbered with shipping.

Vessels should pass eastward of Dikilikaya and should take care to avoid the bank off Büyük liman.

For vessels proceeding southward through the strait it is only necessary 5  
to keep in the fairway.

Vessels entering Umuryeri liman from northward should pass moderately close to Acar burnu (page 160) to avoid the current which sets strongly over Umur bankı; they should keep the shore aboard, and should not open Köybaşı westward of Selvi burnu until the latter point is approached, 10  
when the bank extending from it should be given a berth of one cable.

From abreast Selvi burnu ( $41^{\circ} 08' N.$ ,  $29^{\circ} 04' E.$ ), vessels should keep in mid-channel until abreast Ahırkapı burnu ( $41^{\circ} 00' N.$ ,  $28^{\circ} 59' E.$ ) (page 140) giving a good berth to the banks off Kuruçeşme, unless intending to anchor off Istanbul. See 'Caution' on page 140.

15

*Charts 3930, 2238.*

**NORTHERN APPROACH TO THE BOSPORUS.—Aspect.**—On approaching the Bosphorus from the Black sea in clear weather, the land about the entrance is easily recognised by the peculiar outlines of the mountains on the eastern side of the strait, namely Alemdar (Alam dar) 20  
( $41^{\circ} 03' N.$ ,  $29^{\circ} 13' E.$ ) and Çatal dağ, which tower far above the intervening ranges on the coast of Anadolu, whilst the outlines of the hills on the western side of the strait extend for miles at an apparently uniform elevation. On clear days Alemdar and Çatal dağ are visible from seaward at a distance of 30 miles. See view of the land in the vicinity of the 25  
Bosphorus on Chart 2238.

*Chart 3930.*

Seven red sand patches on the western side of this entrance, between Kilyos and Karaburun ( $41^{\circ} 21' N.$ ,  $28^{\circ} 41' E.$ ) described on page 167, and several large whitewashed patches on the eastern side, described on 30  
page 165, are likewise good marks, even during fogs, as the latter seldom quite obscure the base of the mountains.

On a nearer approach, and when about 11 miles from the entrance, the whitewashed mark upon Yom burnu, appearing in two patches, will serve to point out the position of the lighthouses in the entrance, which soon 35  
after become visible.

The red sand patches about Kilyos, and westward, are next seen, as well as the whitewashed marks upon Eşek adası ( $41^{\circ} 14' N.$ ,  $29^{\circ} 14' E.$ ) and others eastward.

There is a marked difference between the two coasts in this vicinity; 40  
as the coast eastward of the entrance as far as Mağara burnu ( $41^{\circ} 10' N.$ ,  $29^{\circ} 31' E.$ ) (chart 2238) being principally fringed with broken cliffs, there is little or no beach visible until very close inshore; whilst on the western side a long sandy beach extends westward from Kilyos, and is merely divided by Karaburun. From this beach the ground slopes gradually 45  
upwards, forming a number of broad spurs covered generally with sand of a reddish tint, so that at a considerable distance great patches are seen extending from the horizon to the top of the hill.

These distinctive features define the western side of the entrance to the strait as well as Karaburun lighthouse, about 22 miles westward. In the 50  
same way the coast eastward can be identified by the lighthouse on Şile burnu, and by the absence of the sandy patches.

Notwithstanding the above statements it has been reported that the absence of well-defined landmarks makes it very difficult to distinguish the northern entrance to the strait, and that, owing to mirage, Rumeli 55

*Chart 3930.*

lighthouse ( $41^{\circ} 14' N.$ ,  $29^{\circ} 07' E.$ ) is difficult to identify at a distance.

See "False entrances" on page 168.

**Navigational aids.**—For Anadolu and Rumeli lights, and the fog signals sounded from the latter and from Yom burnu, *see* pages 161, 162 and below.

**Identification of Life-saving stations.**—In order that the life-saving stations on either side of the approach to the strait may be readily distinguished from one another, the buildings on the eastern side are marked in black with the odd numbers 1, 3, 5, &c., commencing at Yom burnu and ending at Şile; those on the western side, are marked in white with the even numbers 2, 4, 6, &c., commencing at the station about three-quarters of a mile westward of Rumeli lighthouse. *See* page 25.

**Currents.**—*See* page 47.

**Regulations.**—**Pilotage.**—*See* pages 12, 152 and 161.

15 *Chart 1198.*

**YOM BURNU TO ŞİLE BURNU.**—**Coast.**—**Navigational aids.**—

**Prohibited area.**—Yom burnu ( $41^{\circ} 13' N.$ ,  $29^{\circ} 10' E.$ ) (page 161) is bold and steep-to; it is so much higher than the adjacent land that it obscures Anadolu lighthouse when bearing more than  $236^{\circ}$ . Vessels approaching from eastward in thick weather should, therefore, be careful not to alter course southward until both lights at the entrance to the Bosphorus are sighted, since Elmas burnu, described below, may be mistaken for Yom burnu.

The cliffs at Yom burnu are whitewashed, showing a mark which, in clear weather, can be seen from a northerly direction for about 15 miles; this mark sometimes appears double owing to a division in the marking.

A fog signal is sounded from, and a beacon stands on Yom burnu.

*Chart 3930.*

Between Yom burnu and Elmas burnu about 2 miles eastward, there is a bight, near the head of which, and connected with it by a sandspit, is Soğan yarımadası, which is of some elevation. The head of the bight consists of a sandy beach which is fringed by a shallow bank and should not be approached within one mile. The best position in which to beach a disabled vessel unable to weather Yom burnu is at the mouth of Sowak dere, about one mile east-south-eastward of Yom burnu.

An area in which navigation is prohibited, indicated on the chart, is situated between Yom burnu and Elmas burnu, and about three-quarters of a mile offshore.

Riva dere flows into the eastern corner of the bight, with Riva village close eastward of its mouth. Riva dere is navigable by large boats for a considerable distance, but the passage over the bar is only open during the winter.

Small craft with local knowledge can obtain anchorage in a depth of 24 feet (7m3), about 5 cables north-westward of Riva; the depths decrease rapidly towards the shore.

Elmas burnu, which is steep-to, is a bold headland, and is the termination of a range of hills, which recedes inland, forming the eastern side of the valley through which flows Riva dere. An observation tower stands about 4 cables east-south-eastward of the point.

Eşek adası lies about  $6\frac{1}{2}$  cables east-north-eastward of Elmas burnu at the northern end of a bank, with depths of less than 18 feet (5m5) over it, which extends from the shore. Two above water rocks lie about one cable north-westward and half a cable northward of the northern side of the islet. The islet is high and steep, and consists of two parts, connected in the middle by a low ridge. The cliffs on the northern side have been

*Chart 3930.*

whitewashed and form a mark visible from all directions from seaward.

A light is exhibited, at an elevation of 98 feet (29m9), from a metal tripod, 13 feet (4m0) in height, situated on the western extremity of Eşek adası.

Kelagra burnu, about  $1\frac{1}{2}$  miles eastward of Elmas burnu, is long and sloping. A detached rock lies close off the point. This rock is not of greater elevation than the point, which, in consequence, bears no resemblance to Kara burnu, described below. An observation tower stands about 2 cables south-westward of the point.

The cliffs on the three sides of Kelagra burnu have been whitewashed as a mark for approaching the entrance to the Bosphorus.

Between Kelagra burnu and Kara burnu, about 6 miles eastward, the coast forms a slight bight, the shore of which is moderately straight and consists of yellow cliffs, intersected in places by small valleys with narrow strips of beach. The coastal bank, with depths of less than 18 feet (5m5) over it, extends up to 4 cables offshore between these two points. Foul ground extends a short distance off Adacıklar burnu, one of the highest of the yellow cliffs, about 2 miles east-south-eastward of Kelagra burnu. An observation tower stands on Adacıklar burnu. Foul ground extends north-north-westward for about 4 cables, from a position about  $1\frac{1}{2}$  miles west-south-westward of Kara burnu.

Kara burnu ( $41^{\circ} 14' N.$ ,  $29^{\circ} 22' E.$ ) slopes gradually, but near its extremity is suddenly rises to a curious rampart, consisting mainly of a mass of boulders resembling tombstones. An observation tower stands about one cable southward of the point. The western side of Kara burnu is fringed with rocks, with depths of less than 6 feet (1m8) over them. A spit, with a depth of 18 feet (5m5) over it, extends north-eastward for about 2 cables from this point.

A light is exhibited, at an elevation of 142 feet (43m3), from a white tripod on a round concrete tower, 28 feet (8m5) in height, situated close east-north-eastward of the observation tower on Kara burnu.

**Caution.**—Eastward of Kara burnu, the surveys are old and imperfect. Mariners are warned to navigate with caution when in this area.

**Coast.**—For about  $1\frac{1}{2}$  miles eastward of Kara burnu the coast consists of chalk cliffs within which the land rises gradually to the summit of the coastal range of which Kara burnu is the termination of a spur. Thence to Mağara burnu, about  $5\frac{1}{2}$  miles farther east-south-eastward, there is a low, sandy stretch of coast at the foot of the coastal hills, which recede about  $1\frac{1}{2}$  miles inland. A beacon stands about 8 cables west-south-westward of Mağara burnu.

Between Mağara burnu and Şile burnu about  $4\frac{1}{2}$  miles eastward, the coast forms a slight bight at the eastern end of which is Şile limanı, which is described below. For about  $3\frac{1}{2}$  miles east-south-eastward of Mağara burnu the coast is cliffy and backed by a low range of hills, but thence to within about three-quarters of a mile of Şile burnu, it is low and sandy.

The whole stretch of coast between Kara burnu and Şile burnu is fringed by reefs and, except in Şile limanı, should not be approached within one mile, as within that distance the depths shoal rapidly.

*Chart 2238, plan of Şile limanı.*

**Şile limanı.**—**Aspect.**—**Light.**—**Anchorage.**—Şile limanı is entered westward of Şile burnu, close off which point there is a group of rocky islets. On the summit of the largest of these islets is an old, square tower standing amongst ruins. The town of Şile stands on the summit of the point about a quarter of a mile south-south-westward of its extremity. See view [1].



*Charts 2238, plan of Şile liman.*

To a stranger the bay would seem to offer shelter in a north-easterly gale as the islets appear to form a natural breakwater, but at such times there is a violent sea between them which would render extremely hazardous any attempt to ride out a gale here.

Şile light ( $41^{\circ} 10' N.$ ,  $29^{\circ} 37' E.$ ) is exhibited, at an elevation of 197 feet (60m0), from a stone tower, painted in black and white bands, 62 feet (18m9) in height, situated on rising ground about a quarter of a mile south-south-eastward of the extremity of Şile burnu. This lighthouse is a good mark from all directions seaward.

The best anchorage is a short distance westward of the north-western-most islet, in a depth of 30 feet (9m1), or, nearer the town, in a depth of 18 feet (5m5). The nature of the bottom at the anchorage is hard, white sand. There is a small pier.

H.M.S. *Royal Sovereign*, (25,000 tons displacement) when at anchor, in 1920, off the outer islet experienced but little surface current, but at a depth of from 12 to 18 feet (3m7 to 5m5) there was a strong, cold under-current setting eastward, which often caused the vessel to ride beam on to the prevailing wind, making the anchorage unsatisfactory, the holding ground being poor.

**Life-saving.**—Lifeboats are stationed at Riva, Şile and Kefken adaşı, and there are line-throwing stations at Yom burnu, Riva, Kelagra burnu, Adacıklar burnu, a short distance westward of the rising ground overlooking the rampart near Kara burnu, and on the eastern side of Alacalı, about  $3\frac{1}{2}$  miles east-south-eastward of Kara burnu. See page 25 and for identification marks, see page 163.

*Chart 3930.***WESTERN SHORE OF NORTHERN ENTRANCE TO BOSPORUS.**

—Rumeli lighthouse to Karaburun.—**Navigational aids.**—**Dangers.**

—**Anchorage.**—Between Rumeli lighthouse (page 162) and Dalyan burnu ( $41^{\circ} 15' N.$ ,  $29^{\circ} 02' E.$ ), about  $3\frac{1}{2}$  miles west-north-westward, there are several rocky points of which Uzunye burnu, about  $2\frac{1}{2}$  miles west-north-westward of Rumeli lighthouse, is the most prominent. An observation tower stands about 5 cables north-westward of Rumeli lighthouse. Uzunye burnu is the eastern entrance point of the largest of several coves, open northward, in which there are depths of 18 feet (5m5) about one cable offshore, and in which there is good landing for boats. This cove is the most likely cove in the vicinity in which to beach a vessel in an emergency.

Dalyan burnu terminates in a cliff, from close within which the land rises gradually to a hill inland.

An observation tower stands about  $3\frac{1}{2}$  cables southward of Dalyan burnu.

A light is exhibited, at an elevation of 33 feet (10m1), from a white metal framework tower, 28 feet (8m5) in height, on Dalyan burnu.

A shoal, with a depth of 11 feet (3m4) over it, lies about 5 cables east-north-eastward, and Kalaphotia rock, which is awash, lies about  $1\frac{1}{2}$  cables northward of Dalyan burnu.

Kilyos, an ancient castle, stands on the western end of some cliffs which trend southward and westward for about 6 cables from Dalyan burnu. The village of Kilyos is situated on the slopes behind the castle and little of it is visible from seaward.

Kilyos liman is entered westward of Kilyos. The whole shore of this bay, which is about one mile in extent, is covered with sand thrown up by the waves and carried by the wind over the low coastal hills, which were

*Chart 3930.*

themselves probably formed in this manner, indicating the force with which the wind and sea drive into the bay from the Black sea. These hills form such a contrast in colour to the other parts of the coast, that they are the best marks in the vicinity and may be identified from a considerable distance. 5

Anchorage, sheltered from southerly and easterly winds, can be obtained in Kilyos liman, in depths of from 18 to 24 feet (5m5 to 7m3), hard sand, from 2 to 3 cables offshore abreast Kilyos village. In this vicinity, northerly winds immediately raise a sea all along the coast, and Kilyos liman is then filled with breakers. The swell usually precedes the wind and vessels should get under way on the first indication of approaching northerly winds. 10

It is reported that the depths off Dalyan burnu may vary by as much as from 3 to 5 feet (0m9 to 1m5) according to the wind.

Westward of Kilyos a long sandy beach begins; it is backed by reddish hills the summits of which are covered with vegetation. This beach is fronted by a coastal bank, with depths of less than 18 feet (5m5) over it, which extends up to 4 cables offshore. 15

Kısırkaya (41° 15' N., 28° 59' E.), a rocky point, projects a short distance northward from the general line of the coast. An observation tower stands about 2 cables east-south-eastward of the point, and on the western side obscured from eastward are the buildings of Kısırkaya köyü. Westward of Kısırkaya, the sandy beach, fronted by a coastal bank with depths of less than 18 feet (5m5) over it, extends up to 5 cables offshore, for a distance of 6½ miles. 25

**Caution.**—Between a position about 6½ miles westward of Kısırkaya and Karaburun, the surveys are old and imperfect. Mariners are warned to exercise caution when navigating in this area.

**Coast.**—The red sands of Dumus dere which enters the sea about midway between Kilyos and Kısırkaya, form a good mark for vessels making the northern entrance to the Bosphorus. Westward of the mouth of Dumus dere and between it and Karaburun, there are six other remarkable patches of red sand; the centre patch is situated near Moloz, on which there is an observation tower, about 3½ miles west-north-westward of Kısırkaya; the sixth and largest patch is at Akpınar, about 5 miles westward of Moloz, and just over one mile inland; and the westernmost patch, which is also large, is about 1½ miles from Akpınar. 30 35

About 1½ miles westward of Moloz is Ağacli village. A beacon stands about 3¾ miles north-westward of this village and about 1½ miles northward of Akpınar, and Kunduz beacon, with a refuge house close south-eastward of it, stands in the coast about 4½ miles east-south-eastward of Karaburun. 40

A conspicuous wreck is reported to lie close offshore about 1½ miles east-south-eastward of Kunduz beacon.

The village of Yeniköy, situated on a hill about 1½ miles westward of Kunduz beacon and about half a mile inland, is prominent from seaward. 45

Karaburun is a broad headland with a small bay on either side of it; it is precipitous and steep-to, with depths of 20 fathoms (36m6) about one cable offshore. A small village of the same name stands on the summit and eastern slopes of the headland.

A light is exhibited, at an elevation of 177 feet (53m9), from a white stone tower and dwelling, 27 feet (8m2) in height, situated on the edge of the cliff at Karaburun. 50

**Life-saving.**—Lifeboats are stationed at Kilyos and Karaburun. There are line-throwing apparatus and refuge stations about three-quarters of a mile westward of Dalyan burnu at Kilyos, Kısırkaya, Akpınar, close south-eastward of Kunduz beacon Karaburun, and about 55

*Chart 3930.*

5 miles north-westward of Karaburun; there is also a line-throwing apparatus at Moloz. For identification marks, *see* page 167; *see* also page 25.

5 **DIRECTIONS.**—After making out the entrance of the strait, steer for its western side, which is higher than its eastern, and is seen from a greater distance. Moreover, the eastern side should be avoided, because the current sets right upon it, and the great depths afford no good anchorage in case of bad weather.

10 At night great care is necessary not to mistake the lights at the entrance of the channel for the lights of the coast.

Anadolu lighthouse ( $41^{\circ} 13' N.$ ,  $29^{\circ} 09' E.$ ) may be known by day by a wall running down from it; the differences between the two lighthouses will also be a good guide to distinguish the entrance to the channel, when  
15 when within a short distance of it, Rumeli lighthouse, on the western side, being formed by two towers of different diameters, one above the other, while Anadolu lighthouse, on the eastern, is a single tower.

The depths and nature of the bottom are likewise good guides to ascertain the vessel's position on nearing the strait. In thick and foggy  
20 weather, when approaching from northward, a vessel should endeavour to ascertain her position by sounding. Depths of from 50 to 55 fathoms ( $91\text{m}4$  to  $100\text{m}6$ ), mud and shell, would be an indication of her being off the coast eastward of the entrance; she should then stand cautiously southward, and if the depths shoal rapidly to 45 fathoms ( $82\text{m}3$ ), with the  
25 same bottom, she may steer westward till sand and shells are obtained, when she would be in the fairway of the entrance.

If, on the other hand, mud alone is found at depths of from 50 to 55 fathoms ( $91\text{m}4$  to  $100\text{m}6$ ), the vessel will be off the coast westward of the entrance, and might stand south-eastward till the depths shoal to about  
30 45 fathoms ( $82\text{m}3$ ), mud and shell; the vessel will then have passed just eastward of the entrance, and can proceed as directed above. If a depth of from 37 to 40 fathoms ( $67\text{m}7$  to  $73\text{m}2$ ), sand and shell, be first obtained, a course may at once be steered southward for the strait.

A vessel approaching the strait from eastward or westward should  
35 keep in depths of between 40 and 45 fathoms ( $73\text{m}2$  and  $82\text{m}3$ ) till sand and shells are obtained, when she should be just off the entrance; but a prudent navigator would in no case proceed into depths of less than 45 fathoms ( $82\text{m}3$ ) until one of the lighthouses, or other marks upon the land had been sighted.

40 General regulations for navigating the strait are given on page 162.

**False entrances.**—The two localities that bear the strongest resemblance to the northern entrance of the strait, and which, formerly, were sometimes taken for it, are Şile limanı, described on page 165, on the eastern side, and the neighbourhood of Terkos deresi (Derkos lake)  
45 (chart 2230), *see* page 170, on the western side, but with ordinary care, the aid of the lighthouses, life-saving stations, and whitewashed marks, mistakes should not occur.

If off Şile ( $41^{\circ} 10' N.$ ,  $29^{\circ} 37' E.$ ), in thick or foggy weather, soundings will identify the position, as off here a bank of shells extends fully 5 miles  
50 offshore, whereas at that distance from the true entrance, sand mixed with shells would be obtained with a greater depth.

Also off Terkos deresi soundings will at once dispel the illusion as, mud and shells or shell alone will be obtained, but not sand and shell.

An inspection of the chart will show the greater difference, both in  
55 the depths and nature of the bottom, between the banks off the respective

*Chart 3930.*

sides of the entrance. Westward of Karaburun ( $41^{\circ} 20' N.$ ,  $28^{\circ} 40' E.$ ), on the western side, depths of less than 100 fathoms (182m9) extend more than 20 miles offshore. This distance decreases gradually towards the entrance, where it is about 15 miles.

The depths over this bank gradually decrease towards the shore, the bottom at first being ooze, which changes to mud and broken mussel shells when within an average distance of 7 miles offshore; when within 3 miles, the bottom changes to shells, and at one mile offshore to sand. Off Karaburun and westward, patches of ooze, mixed with a soft yellow clay, are found in the mud bank, giving a streaky appearance of blue and yellow to what is brought up by the lead.

Off the coast eastward of the entrance to the strait, depths of less than 100 fathoms (182m9) do not, until 20 miles eastward of the entrance, extend more than 10 miles offshore; the depths decrease more rapidly, and the bottom is mud and small round shells, quite unlike the broken mussel shells off the western coast. The bank of shells also extends much farther offshore, in some places as far as 5 miles, but changes to sand when within one mile, as on the other side.

Immediately off the entrance to the strait, the bottom at first is found to be similar to that off the coast westward of it, but a bank of sand and shells extends about 7 miles in a north-north-easterly direction, having eastward mud and shells, and westward mud only, a sufficient indication in itself of the true entrance to the strait, as in no other place in the vicinity will the lead bring up sand and shells in depths of from 36 to 40 fathoms (65m8 to 73m2).

## CHAPTER V

WESTERN SHORE OF BLACK SEA: KARABURUN TO  
BUKHTA ZHEBRIYANSKAYA

*Chart 3930.*

**GENERAL REMARKS.**—A description of the northern approaches to the Bosphorus together with the coastline for some distance on either side of the entrance is given on pages 163–168.

- 5    Directions for approaching the Bosphorus from the Black Sea are given on page 168.

The areas in which anchoring and fishing are prohibited, are given on page 153.

- 10    **Areas dangerous due to mines.**—There are several areas off the coasts of Bulgaria and Rumania, which are described in this volume, which are dangerous for navigation due to mines. The routes through these areas are described in Nemedri (*See N.P.100, The Mariners' Handbook*), and Admiralty Notice to Mariners No. 18 of the current year. *See also page 13.*

15    *Chart 2230.*

**KARABURUN TO KORU BURNU.—Dangers.—Anchorages.—**

- Light.**—From Karaburun ( $41^{\circ} 21' N.$ ,  $28^{\circ} 41' E.$ ) (page 167) the coast is high and rocky as far as Kılıç (Kilidj) burnu, about  $1\frac{1}{2}$  miles north-westward. Farther north-westward there are patches of sand, and the western part of this high stretch of coast at the mouth of Darboğaz (Derkos) deresi, about one mile north-westward of Kılıç burnu, consists of a large bare patch of white sand; this patch is not visible eastward of the meridian of Karaburun.

- 25    Terkos gölü (Derkos lake) lies about  $1\frac{1}{2}$  miles inland with its outlet through Darboğaz deresi, which is often closed during the summer months. This lake is bounded southward by an irregular range of hills which bear some resemblance to the winding shores of the Bosphorus and are deceptive, especially in thick weather. The locality is known as the False entrance as it has frequently been mistaken for the true entrance to the strait; care should, therefore, be taken to guard against such a mistake. *See also page 168.*

The country in the vicinity of Terkos gölü is covered with brushwood and trees.

- 35    About 3 miles west-north-westward of the mouth of Darboğaz deresi the coast is steep and rocky and is covered with brushwood and stunted trees; low hills commence here and extend along the coast north-westward, showing a yellowish appearance from seaward.

A rocky reef, which dries, extends about  $1\frac{1}{2}$  cables offshore about 4 miles westward of the mouth of Darboğaz deresi.

- 40    **Asar Tefvik kayası**, a 12-foot (3m7) patch, lies about half a mile offshore, about  $8\frac{1}{2}$  miles west-north-westward of the mouth of Boğaz deresi.

Malatra burnu ( $41^{\circ} 34' N.$ ,  $28^{\circ} 11' E.$ ), about 24 miles west-north-westward of the mouth of Darboğaz deresi, is steep, high and rocky, but is not easily identified from the offing.

*Chart 2230.*

Light-draught vessels with local knowledge may obtain anchorage during offshore winds on a bottom of sand and shell off the mouth of Çilingos (Chelengos) deresi, about 3 miles south-eastward of Malatra burnu. It is reported however, that better anchorage for these vessels may be obtained in Kasatura körfezi (Kastro deresi), a cove about 2 miles north-westward of Malatra burnu where a rock, situated close southward of the northern entrance point of the cove, affords some shelter from northerly and north-easterly winds. This anchorage is in a depth of 18 feet (5m5), sand, with the southern extremity of the rock bearing 065°. 5 10

About 3 miles north-westward of Kasatura körfezi is a steep cliff between the mouths of two streams, above which cliff is the small town of Midye (Midiah), *see* view [2].

On the southern side of the cliff near Midye there is a creek about half a cable wide. Small craft with local knowledge can obtain anchorage sheltered from northerly winds in this creek, in depths of from 9 to 12 feet (2m7 to 3m7), sand. The anchorage off Midye is over a rocky bottom and is indifferent. 15

Servi (Serveh) burnu ( $41^{\circ} 40' N.$ ,  $28^{\circ} 06' E.$ ), about  $1\frac{1}{4}$  miles northward of Midye, projects eastward from the general line of the coast. There are some streaks of reddish-coloured rock on the slopes within it. A pyramidal rock stands near the extremity of the cape and a reef extends  $1\frac{1}{4}$  cables south-eastward from it. Though this cape affords shelter from northerly winds in the bight southward of it the bottom in the vicinity is foul and rocky. 20 25

At Sandal burnu about  $4\frac{1}{2}$  miles north-westward of Servi burnu, there are some white cliffs, by which the point may be identified. The coast in the vicinity of this point is clearly distinguished by the mountains of Kokmuş tepe (Agios Pavla) and Bezirgan tepe (Inada), about 3 miles westward, and 5 miles west-north-westward, respectively, of the point. Kokmuş tepe has two peaks of which the northern is the higher; Bezirgan tepe is 1,300 feet (396m2) high and is situated between the coast and a range of mountains inland. 30

*Chart 2230, plan of Inada road.*

Koru burnu (Cape Kuri), about 12 miles northward of Servi burnu, is the south-eastern extremity of a promontory of moderate elevation which extends south-south-eastward from the general line of the coast. The coast of this promontory is sloping and of a yellowish appearance; the village of Limanköy is situated between Koru burnu (Limanköy) lighthouse and Igneada burnu. The depths close off the cape are uneven and it should be given a berth of at least a quarter of a mile. 35 40

Igneada (Inada) burnu, about half a mile westward of Limanköy is the southern extremity of the promontory described above; it is fringed by sunken rocks, which extend about one cable offshore.

Igneada light is exhibited, at an elevation of 144 feet (43m9), from a white masonry tower 26 feet (7m9) in height situated on Limanköy. 45

**Igneada road.—Dangers.—Anchorage.**—Igneada (Inada) road is entered between Igneada burnu and a village of the same name situated on the shore about  $2\frac{1}{4}$  miles westward. A reef of sunken rocks extends about 2 cables south-westward from the shore near a ruined tower situated about 6 cables north-westward of Igneada burnu. There is a cliff with some remarkable white rocks about 3 cables southward of Igneada village; on its northern slope there is a large warehouse and farther northward there are several buildings. There is a beach at the head of Igneada road; a bank with depths of less than 18 feet (5m5), extends up to  $3\frac{1}{2}$  cables off this beach and about  $1\frac{1}{2}$  cables offshore abreast the village. 50 55

*Chart 2230, plan of Inada road.*

The usual landing place is at a quay at Aypolos iskele, near the village, alongside which small craft can moor in fine weather.

- The best anchorage in İğneada road is in from 36 to 42 feet (11m0 to 12m8), sand, with fair holding ground, about three-quarters of a mile offshore west-south-westward of the ruined tower and with İğneada burnu bearing 091°, distant 1½ miles. If making a long stay, a vessel should lift her anchor from time to time as it may become so deeply embedded as to be difficult to weigh. A heavy swell sets in at times, causing a vessel to roll heavily, and at such times an eddy sets strongly towards Karu burnu. In this roadstead, as in all places along the coast, in summer the winds shift towards the shore during the night.

**Regulations.**—Similar regulations to those for Karabiga, *see* page 110, are in force for vessels proceeding in İğneada.

15 *Chart 2230.*

**KORU BURNU TO BURGASKI ZALIV.—Dangers.—Anchorages.—International boundary.—Navigational aids.**—Beyendik burnu (41° 58' N., 28° 03' E.), situated about 5 miles northward of Koru burnu is the southern entrance point of a cove of which Nos Rezovo is the northern entrance point. *See* view [3]. Anchorage may be obtained by small vessels, sheltered from northward, in this cove in depths of about 18 feet (5m5). The village of Beyendik is situated on the southern side of the cove. Westward of Nos Rezovo is the village of the same name.

- 25 Rezve deresi flows into the head of the cove and forms the seaward end of the International boundary between Turkey and Bulgaria.

- Nos Sinemoretz (Galajio point) is situated about 5½ miles north-north-westward of Nos Rezovo; Nos Akhtopol 3½ miles farther north-north-westward is the southern entrance point of a small bay of the same name, in which is situated the village of Akhtopol (Agathopoli) (42° 06' N., 27° 56' E.). *See* view [4]. There is a timber wharf with a crane in the north-eastern part of the bay. The village is connected by road with Rezovo and Burgas (page 181).

- A light is exhibited at an elevation of 45 feet (13m7) from a white, round, tower with a framework superstructure, 37 feet (11m3) in height, on Nos Akhtopol.

- There is anchorage for small craft, with local knowledge, in Akhtopol bay in a depth of about 24 feet (7m3), sand, with shelter from all but easterly winds, which can be avoided by approaching nearer to the town. The greater part of this bay has depths of only about 12 feet (3m7). The entrance is about half a cable wide and has depths of 35 feet (10m7) it lies between a reef of rocks, most of which are visible, which borders the northern side, and the southern entrance point, which is steep-to.

- Mount Papiya (Paphia), 1,680 feet (512m1) high, lies about 4 miles west-north-westward of Akhtopol; it can easily be identified by its steep and rather pointed formation.

- The town of Michurin (Tsarevo) stands on the shores of Michurin cove, which lies about 5½ miles north-westward of Akhtopol. Eastward of the southern entrance point, and about 3½ cables offshore, there are some above-water rocks. A reef extends off the northern entrance point. There is a small harbour, protected by a breakwater, with two quays, with lengths of about 300 and 250 feet (91m4 and 76m1), respectively, alongside which small craft with local knowledge can secure. There is a hospital at Michurin. *See* view [5].

- 55 A light is exhibited, at an elevation of 39 feet (11m9), from a white,

*Chart 2230.*

round, concrete tower, 26 feet (7m9) in height situated on Nos Kastro the southern entrance point of Michurin cove.

A light is exhibited, at an elevation of 37 feet (11m3), from a white circular tower, 22 feet (6m7) in height, situated on the head of the break-water in Michurin cove. 5

Large vessels can obtain anchorage in depths of from 11 to 15 fathoms (20m1 to 27m4), sand, off the entrance to Michurin cove.

Kara Agach (Agatch) cove is entered southward of Nos Urdoviza situated about 5 miles north-westward of Michurin cove. This point can be easily distinguished from the other points in the vicinity as it is white and steep, and its summit is covered with high trees; a sunken reef extends about one mile south-eastward from it. 10

Small craft with local knowledge can find well-sheltered anchorage, in depths of about 24 feet (7m3), abreast a stream in the northern part of Kara Agach cove, with a stern hawser laid out to the shore. The approach to this anchorage is from southward, and a vessel should keep the western shore aboard before standing in for the anchorage. 15

Dyavolski zaliv is entered between Nos Konnik (Athanatos point) (42° 15' N., 27° 46' E.), about one mile north-westward of Nos Urdoviza, and Nos Kyupriya (Zunaritsa point), about 1½ miles northward. This bay is open eastward and has depths of about 48 feet (4m6) over a sandy bottom. A sunken reef, on which there some are above-water rocks, extends about 1½ cables northward from Nos Konnik, and a similar reef, which partly shelters the anchorage, extends about the same distance south-south-eastward of Nos Kyupriya. 20 25

Primorsko light is exhibited, at an elevation of 22 feet (6m7), from a white circular tower, 13 feet (4m0) in height, situated on the head of a pier in Dyavolski zaliv, about half a mile westward of Nos Kyupriya.

Small craft, with local knowledge, can find anchorage in Dyavolski zaliv, which should be entered with the point on its western shore bearing 293°. There is room for several small vessels, with their sterns secured to the shore, in depths of from 24 to 30 feet (7m3 to 9m1), in a small bight between the cliffs westward of Nos Konnik. A creek, about 130 feet (39m6) wide, forms a part of this bight; its entrance is narrow but there is much more room within it. Vessels proceeding to this bight should, on opening it out, steer for it when it bears 180°. 30 35

There is anchorage also in the northern part of Dyavolski zaliv with the vessel's stern secured to the shore, in about 24 feet (7m3), between the reef which extends off Nos Kyupriya and the beach which forms the northern shore. The sea sometimes sets in during fresh south-easterly winds, but these do not blow home. Care should be taken when approaching this anchorage to avoid a long, flat shelf of sunken rocks which extends southward from the second prominence westward of Nos Kyupriya; vessels should after passing southward of the reef off Nos Kyupriya, continue westward and not haul up for the anchorage until the end of the beach bears 324°. 40 45

Maslen nos (Cape Zeitin), situated about 3 miles north-north-eastward of Nos Kyupriya, is high and steep and projects about half a mile eastward from the general line of the coast. It is fringed by sunken rocks and the cape should be given a berth of at least 3 cables. 50

A light is exhibited, at an elevation of 123 feet (37m5), from a white, circular stone tower, 19 feet (5m8) in height, situated on Maslen nos. A fog signal is sounded from a square masonry tower close to the lighthouse. It was reported in 1963, that a radiobeacon transmits from the lighthouse. 55



*Chart 2230.*

In a bay southward of Maslen nos, the bottom is rocky in places, making it unsuitable for anchorage.

Nos Korakya (Baghlar point) situated about 2 miles north-north-  
5 westward of Maslen nos, is steep-to.

**BURGASKI ZALIV.—Aspect.**—Burgaski zaliv (Burghaz gulf) is entered between Nos Korakya ( $42^{\circ} 20' N.$ ,  $27^{\circ} 47' E.$ ) and Nos Emine (Cape Emineh), about  $22\frac{1}{2}$  miles north-north-eastward, and is the only part of the western side of the Black sea in which there are several good anchor-  
10 ages. The northern side of the inner part of the gulf is encumbered by several patches of rock and foul ground, which restrict anchorage in that part of it. The town of Burgas is situated at the head of the gulf.

Mount Bakurluka ( $42^{\circ} 24' N.$ ,  $27^{\circ} 36' E.$ ), 1,204 feet (367m) high, lies about 9 miles north-westward of Nos Korakya. This mountain is the  
15 most noticeable of the chain of mountains which rise within the shores of the gulf; from south-eastward its summit appears rounded, but from north-eastward, as a double peak. Farther south-eastward there is a saddle-shaped mountain. Inland, a ridge with five peaks, of which the two westernmost are particularly conspicuous, extends a considerable  
20 distance; the westernmost peak is pointed and is sharply divided from the adjacent one; all five peaks are clearly visible when approaching the gulf from north-eastward.

Shiloto (Muris dagh) is the highest of three mountains which rise from a valley within the head of the gulf; it is conical and is an excellent mark.  
25 The other two mountains are oval, with nipple-shaped summits; one appears behind the northern slope of Shiloto, and the other lies south-eastward of Shiloto.

A wooded range extends along the northern shore of the gulf and terminates eastward in four peaks close north-eastward of the village  
30 of Kableshkovo (Daghutli); these peaks are situated about 4 miles westward of Nos Emine and are very easily identified. At the western extremity of this range are three remarkable peaks, and some distance farther westward is a fourth, which is completely isolated.

*Chart 2399, plan of Nesebür to Nos Emine.*

30 Nos Emine rises to Sveti Iliya (Mount Emineh) 1,266 feet (385m) high, a prominent, rounded and tree-covered mountain, about  $1\frac{1}{2}$  miles north-westward of the cape. About 4 miles westward of Sveti Iliya is Mount Vlas (Mt. St. Elias), 1,148 feet (349m) high.

**Caution.**—Attention is drawn to an area on the Bulgarian coast  
40 between the entrance to Burgaski zaliv and the entrance to Varna bay (page 184) which is dangerous on account of mines; see Nemedri and page 13.

**SOUTHERN SIDE OF BURGASKI ZALIV.—Coast.—Anchorage.**—Kavatsite (Kavak) bay is entered between Nos Agalina ( $42^{\circ} 23' N.$ ,  
45  $27^{\circ} 43' E.$ ) about  $3\frac{1}{2}$  miles north-westward of Nos Karakya and Nos Kolokita (Kolakythes). About 2 miles farther north-north-eastward, which is the south-eastern extremity of a tongue of land which projects about one mile eastward from the general line of the coast. Some above-water rocks lie about 2 cables southward of Nos Kolokita, otherwise the  
50 shore of this bay appears to be bold.

During the summer, good anchorage can be obtained off Kavatsite bay, in depths of from 18 to 20 fathoms (32m9 to 36m6), mud, about  $1\frac{1}{2}$  miles offshore. Large vessels should anchor with the northern entrance point of the bay bearing less than  $360^{\circ}$ .

*Chart 2399, plan of Burgaski zaliv.*

The town of Sozopol ( $42^{\circ} 26' N.$ ,  $27^{\circ} 42' E.$ ) is situated on a peninsula terminating in Nos Skamniya, the north-western entrance point of Zaliv Kampifes, and also the eastern entrance point of Zaliv Zozopol. Nos Kharmanite (Akroleri) is the south-eastern entrance point of Zaliv Kam- 5  
pifes and the north-western entrance point of Zaliv Akrotiriya (Akroteri), north-westward of Nos Kolokita.

Mount Bakurluka is a good landmark for identifying Sozopol: *see* also view [6].

**Zaliv Sozopol and approaches.—Islands and dangers.—Navigation- 10**  
**aids.—Anchorage.**—Zaliv Sozopol is entered between Agios Petros, an islet lying about  $1\frac{1}{2}$  cables westward of Kiril peninsula on which is the town of Sozopol, and a small peninsula terminating in Nos Khrisosotira ( $42^{\circ} 26' N.$ ,  $27^{\circ} 39' E.$ ), about  $1\frac{1}{2}$  miles westward. Foul ground extends about  $1\frac{1}{2}$  cables eastward of Nos Khrisosotira. 15

The island of Sveti Ivan lies in the approach to this bay, about 6 cables northward of Agios Petros. Sveti Petur ialet lies close off the eastern extremity of Sveti Ivan, to which it is connected by a reef, and a shoal with a depth of 7 feet (2m1) over it, lies about 2 cables south-westward of its western extremity. 20

A light is exhibited, at an elevation of 143 feet (43m6), from a white, circular, concrete tower and dwelling, 30 feet (9m1) in height, situated on Sveti Ivan. A fog signal is sounded from the lighthouse.

Agios Petros is connected with the peninsula eastward by a breakwater. The entry to a small harbour southward of this breakwater is from south- 25  
westward, and it is only available to small vessels with local knowledge. A rocky shoal, with depths of from 3 to 4 feet (0m9 to 1m2), lies southward of Agios Petros and about  $2\frac{1}{2}$  cables westward of the isthmus. A light is exhibited, at an elevation of 29 feet (8m8), from a white, square, stone tower with a framework superstructure, 26 feet (7m9) in height, situated 30  
on the western side of the shoal.

The best and most sheltered anchorage in Sozopol bay is in its south-eastern part, in depths of from 36 to 42 feet (11m0 to 12m8) opposite a ravine in the cliff where there is a coal depot and pier, with the western extremity of Agios Petros in line with the eastern extremity of Sveti Petur, bearing 35  
 $035^{\circ}$ , or in lesser depths nearer the pier. During winter, although the strong north-easterly winds raise a considerable sea, the eastern side of the bay is said to be safe for a well-found vessel.

**Nos Khrisosotira to Foros bay.—Dangers.—Anchorage.— 40**  
**Light.—Signal station.**—Nostalasakra (Kavos Nikolo) a point situated about  $1\frac{1}{2}$  miles northward of Nos Khrisosotira, is steep-to; between it and Nos Akin ( $42^{\circ} 28' N.$ ,  $27^{\circ} 38' E.$ ), about  $1\frac{1}{2}$  miles north-westward, there is a bay which is open north-eastward and is therefore seldom used as an anchorage. A rocky shoal, on which there are several above-water rocks, 45  
lies about 2 cables north-eastward of Nos Akin. There is a narrow passage, in which there are depths of 48 feet (14m6), between this shoal and the cape. This shoal is covered by the *red* sector of Ostrov Bolshevik (Sveti Anastasya) light, *see* below. Two rocks, with depths of 51 and 55 feet (15m5 and 16m8) over them, lie respectively, about one mile, and about 6 cables north-north-eastward of Nos Akin. 50

Between Nos Akin and Nos Atiya (Monopetra Atiya kavo), about 2 miles westward, there is a bay, open northward, in the western part of which, about 9 cables south-eastward of the latter point and about 3 cables offshore, there is a shoal with a least depth of 9 feet (2m7).

Nos Atiya is fringed by above-water and sunken rocks; it may be easily 55

*Chart 2399, plan of Burgaski zaliv.*

identified by Budzhaka an isolated, rounded and wooded hill, about 5 cables southward of it.

A signal station is situated on Nos Atiya.

- 5 An Hellenic fortress is situated on the hill, and close northward of it there is a white rectangular beacon with a black stripe down the centre, 29½ feet (9m0) in height, standing at an elevation of 358 feet (109m1).

Safe and sheltered anchorage may be obtained in the bay westward of Nos Akin, in depths of from 30 to 54 feet (9m1 to 16m5), sand; care should  
10 be taken to avoid the 9-foot (2m7) shoal in the western part of the bay.

- Atiya bay, entered between Nos Atiya and Nos Chukalya (Sukala point) upon which there is a conspicuous white house, about 2 miles westward, is moderately sheltered from all winds, but it is seldom visited as Zaliv  
15 Tsiganaki Pristan (Chengene Skelya), described below, affords better security. Nos Chukalya is high and rises to a saddle-shaped hill, the cleft between its summits being visible from a considerable distance eastward. Nos Buffos, about 3 cables eastward of Nos Chukalya, rises to a hill on the summit of which is a monastery. Foul ground extends about  
20 2½ cables off Nos Chukalya and the western part of the bay is encumbered with shoals, with depths of less than 18 feet (5m5), which extend as much as 4 cables offshore; amongst these shoals is a rock, with a depth of 4 feet (1m2) over it, situated about 3½ cables eastward of Nos Buffos.

- Ostrov Bolshevik (Sveti Anastasiya), an islet about 80 feet (24m4) high,  
25 situated about 8 cables north-eastward of Nos Chukalya, is surrounded by a shallow flat which extends as much as one cable off its south-eastern side.

- A light is exhibited, at an elevation of 71 feet (21m6), from a white, circular, concrete tower, 30 feet (9m1) in height, situated on Ostrov  
30 Bolshevik.

Zaliv Tsiganaki Pristan is entered between Nos Chukalya (42° 27' N., 27° 32' E.) and Nos Foros (Poros) about 2½ miles westward.

- An oil jetty, situated at the end of an approach arm, about 2 cables long, extends west-south-westward from the shore about 3 cables south-westward  
35 of Nos Atiya. Two pillar buoys are moored about 2 and 4 cables west-south-westward of the jetty. It is reported that this jetty is capable of handling one tanker a day.

- There is a quarantine station near the village of Nadezhda about one mile south-eastward of Nos Foros. It can be identified by a prominent  
40 chimney, a flagstaff and a pier.

Nos Foros is fringed by a rocky reef which extends about 2 cables northward from it; there is a white beacon on the point.

- Vessels seeking shelter in Burgaski zaliv generally anchor in Zaliv Tsiganaki Pristan, which, indeed, is reported to be the best anchorage  
45 between the Bosphorus and River Danube. It is sheltered from all winds, the bottom is mud, and the holding ground is good.

- Prohibited area.**—A small area prohibited to navigation lies in the middle of the entrance to Zaliv Tsiganaki Pristan. A red conical buoy, with four white stripes and one white band, marks the centre of the area and is  
50 moored nearly 1½ miles west-north-westward of Nos Chukalya; the prohibited area extends one cable in all directions from the buoy, the charted position of which is approximate.

- Local magnetic anomaly.**—A local magnetic anomaly with a magnitude of up to 18° has been reported in the vicinity of Ostrov Bolshevik.  
55 vik.

*Chart 2399, plan of Nesebür to Nos Emine.*

**NORTHERN SIDE OF BURGASKI ZALIV.**—**Nos Emine to Nesebür.**—**Dangers.**—**Anchorage.**—**Navigational aids.**—Nos Emine ( $42^{\circ} 42' N.$ ,  $27^{\circ} 54' E.$ ) is a bold headland with cliffs from 120 to 150 feet (36m6 to 45m7) high. Saint Nicholas monastery stands on the coast about half a mile northward, and a small, white guardhouse stands about 3 cables south-westward of the south-eastern extremity of the cape. A submerged rocky flat extends about 2 cables eastward from the cape and there are depths of 30 feet (9m1) about 3 cables off it. *See view [7].*

A light is exhibited, at an elevation of 204 feet (62m2), from a small tower on a white building, 20 feet (6m1) in height, situated on the extremity of Nos Emine. A signal station is situated about  $1\frac{1}{2}$  cables west-south-westward of the lighthouse. It was reported in 1963 that a radiobeacon transmits from the lighthouse.

From Nos Emine the northern side of the gulf trends westward for about 8 miles, and the land within it rises to the high, wooded range described on page 174, whence it turns southward abruptly and becomes low and sandy. A white building about  $2\frac{1}{2}$  miles westward of Nos Emine is a good landmark.

The town of Nesebür, situated about  $7\frac{1}{2}$  miles west-south-westward of Nos Emine, occupies the whole of the rocky peninsula upon which it stands and which is connected with the mainland westward by a narrow, sandy isthmus, sometimes covered by the sea. This peninsula is fringed by a submerged reef which extends as much as 4 cables eastward from it. This reef is covered by the *red* sector of Nesebür light between the bearings of  $240^{\circ}$  and  $258^{\circ}$ .

A light is exhibited, at an elevation of 28 feet (8m5), from a white, stone tower, situated on the southern side of the peninsula on which is the town of Nesebür ( $42^{\circ} 40' N.$ ,  $27^{\circ} 44' E.$ ).

The bay entered between Nos Emine and Nesebür affords good anchorage in depths of from about 48 feet to 12 fathoms (14m6 to 21m9); it is open between east and south, and vessels usually anchor in its western part. The best anchorage in the eastern part of the bay is in depths of 54 feet (16m5), mud, about  $2\frac{1}{2}$  miles westward of Nos Emine and about half a mile offshore. Anchorage may also be obtained northward of the town of Nesebür, in depths of about 42 feet (12m8), but this anchorage is exposed to the squalls which, during northerly winds, blow violently off the high land within Nos Emine.

**Off-lying danger.**—Cockatrice shoal, with a least depth of 30 feet (9m1) over it, lies about  $3\frac{1}{2}$  miles southward of Nos Emine.

*Chart 2399, plan of Burgaski zaliv.*

**Nesebür to Pomorie.**—**Anchorage.**—**Banks and shoals.**—**Light.**—Nos Akrotiriya (Koritoriya), a steep, rocky point lying about one mile south-westward of Nesebür, is fringed by a sunken reef which extends up to 4 cables west-south-westward of it.

Anchorage may be obtained off the coast between Nesebür and Nos Akrotiriya, in depths of from 30 to 48 feet (9m1 to 14m6), sand and shell, about 4 cables offshore abreast a fountain.

Nos Ravda, a white, rocky point about  $1\frac{1}{2}$  miles west-south-westward of Nos Akrotiriya, is fringed by a sunken reef which extends about  $2\frac{1}{2}$  cables offshore. A tumulus, situated about half mile northward of Nos Ravda is prominent.

Ravda rock, with a least depth of 17 feet (5m2) over it, lies about three-quarters of a mile south-south-westward of Nos Ravda. The western extremity of the town of Nesebür bearing  $047^{\circ}$  and open south-eastward of Nos Akrotiriya, leads south-eastward of this rock.

*Chart 2399, plan of Burgaski zaliv.*

Chimovo river flows into the gulf about three-quarters of a mile south-westward of Nos Chimovo which lies about one mile westward of Nos Ravda.

- 5 Chimovo rocks, with depths of from 21 to 30 feet (6m4 to 9m1) over them, lie about three-quarters of a mile offshore and from about 1½ to 2½ miles southward of Nos Chimovo.

During summer there is anchorage in a depth of 36 feet (11m0), with the mouth of Chimovo river bearing 304°.

- 10 The town of Pomorie (42° 33' N., 27° 39' E.), about 5 miles southward of Nos Chimovo, is scattered along the cliff at the extremity of Pomorie peninsula which is connected with the mainland by a low tongue of sand. A Byzantine church, situated at the eastern extremity of the peninsula, and a four-storeyed building, situated about one mile north-westward of the town, are prominent. The town is connected with the general railway system, and local vessels call here.

- The rocky peninsula is fringed by a bank, with depths of less than 30 feet (9m1), which extends about 1½ miles north-eastward, and about three-quarters of a mile south-eastward from it; the north-eastern part of this bank is known as North-east Pomorie reef and on it there are some detached patches with depths of less than 18 feet (5m5); the south-eastern part is known as Stavrova (South-east Pomorie) reef and on it is a rocky patch with depths of less than 6 feet (1m8). A spit with depths of less than 18 feet (5m5) over it, extends about three-quarters of a mile west-south-westward of the southern side of the tongue of sand connecting the peninsula with the mainland.

A light is exhibited, at an elevation of 33 feet (10m1), from a white, stone tower enclosed by a stone wall, situated on Stavrova reef.

- Off-lying dangers.—Buoy.—There are several dangers lying between south-south-eastward and south-south-westward of the town of Pomorie. Stavro rock, the outermost of these dangers, with a least depth of 15 feet (4m6) over it, lies about 2 miles south-south-westward of Stavrova Reef lighthouse. See view on the plan.

- A light-and-bell-buoy, painted in red and white stripes, fitted with a radar reflector and exhibiting a *white flashing light every six and a half seconds*, is moored 1½ cables south-eastward of Stavro rock; the charted position of the light-and-bell buoy is approximate.

- Crescent shoal, with depths of from 27 to 30 feet (8m2 to 9m1) over it, lies from about half a mile to 1½ miles southward of Stavrova Reef lighthouse. A detached 30-foot (9m1) shoal lies with its centre about 3½ cables southward of the southern end of Crescent shoal.

Pomorie bank, with a least depth of 19 feet (5m8) over it, lies about 1½ miles south-westward of Stavrova Reef lighthouse.

- The light at the head of the eastern mole at Burglas harbour, see page 180, is obscured over Stavro rock, Crescent shoal and Pomorie bank.

**Prohibited anchorage.**—Anchoring and fishing are prohibited in a circular area of radius one mile indicated on the chart with its centre about 7½ cables southward of Stavro rock.

- Pomorie to Nos Burgas.—Beacon.—Dangers.—Anchorages.**—Between the extremity of Pomorie peninsula (42° 33' N., 27° 45' E.) and Nos Burgas about 8 miles west-south-westward, the coast forms a bight the shore of which is fringed by a bank which extends as much as three-quarters of a mile offshore in places. A beacon, consisting of a rectangular framework structure, stands on a tumulus about 4½ miles west-north-westward of the town of Pomorie and about half a mile inland.

*Chart 2399, plan of Burgaski zaliv.*

Pomoriysko ezero is a shallow lake extending about 3 miles northward from a position about one mile north-westward of Pomorie town.

Nos Krotiriya (Red Cliff point) ( $42^{\circ} 33' N.$ ,  $27^{\circ} 36' E.$ ) is situated about 2 miles westward of the extremity of Pomorie peninsula with Nos Lakhna (Lakhana) about  $1\frac{1}{2}$  miles farther west-south-westward. Atanasovsko ezero is an extensive lagoon extending about  $5\frac{1}{2}$  miles northward from a position about one mile northward of Burgas town, and separated from the bight described above by a narrow sandy spit.

Lakhana rock, with a least depth of 18 feet (5m5) over it, lies about 9 cables southward of Nos Lakhna.

Soka shoals, consisting of some rocky patches with depths of from 12 to 18 feet (3m7 to 5m5) over them, lie about 2 miles westward of Lakhana rock and about one mile offshore.

During north-easterly winds there is safe anchorage in the western part of a bight westward of the town of Pomorie, in depths of from 24 to 30 feet (7m3 to 9m1), sand, from 2 to 3 cables offshore. Anchorage may also be obtained farther south-westward, in depths of from 36 to 42 feet (11m0 to 12m8), but this anchorage is exposed to easterly and south-easterly winds.

**Off-lying dangers.**—Spitfire rock, with a least depth of 18 feet (5m5) over it, lies about  $4\frac{1}{2}$  miles east-north-eastward of Nos Burgas. Nos Emine, bearing  $051^{\circ}$  and open south-eastward of the peninsula on which is the town of Pomorie, leads south-eastward of Spitfire rock.

Blonde or Burgas rock, with a least depth of 28 feet (8m5) over it, lies about  $2\frac{1}{2}$  miles east-north-eastward of Nos Burgas. Shiloto (page 174) bearing  $246^{\circ}$  and open southward of Nos Burgas, leads close southward of Blonde rock.

The light at the head of the eastern mole of Burgas harbour is obscured over Spitfire and Blonde rocks.

*Chart 2399, plan of Burgas bay.*

**BURGAS BAY AND PORT.**—**Dangers.**—**Buoyage.**—Burgas bay is entered between Nos Foros ( $42^{\circ} 27' N.$ ,  $27^{\circ} 29' E.$ ) (page 176) and Nos Burgas about  $1\frac{1}{2}$  miles northward.

Foros bay is entered between Nos Foros and the shore at the head of Burgas bay, about  $1\frac{1}{2}$  miles westward. Within its entrance, the depths in this bay shoal rapidly and a sand flat, which dries, extends about half a mile off its head. A channel, with a depth of about 3 feet (0m9) over its bar, leads through this mud flat into Ezero Uzun Geren, a large lagoon within the head of the bay, in which there are depths of from 3 to 4 feet (0m9 to 1m2). The western shore of Burgas bay consists of a low, narrow and sandy beach, which separates Burgasko ezero from the bay, and extends northward to the high land on which the town of Burgas is built. A white casino stands on the eastern side of the town about a quarter of a mile north-north-eastward of Nos Burgas, and is prominent. A pier projects eastward from the coast about  $1\frac{1}{2}$  cables north-north-eastward of the casino.

Burgas shoals, consisting of a number of detached rocky patches, extend about one mile eastward from Nos Burgas. The outermost of these patches has depths of from 19 to 28 feet (5m8 to 8m5) and the least depth lies about 9 cables eastward of the lighthouse on the head of the eastern mole of Burgas harbour; between this patch and the shore there are several patches with depths of from 12 to 18 feet (3m7 to 5m5). The rectangular framework beacon, *see* above, on the tumulus about  $4\frac{1}{2}$  miles west-north-westward of Stavrova Reef lighthouse, bearing  $016^{\circ}$  and in line with the four peaks north-eastward of the village of Kableskhovo

*Chart 2399, plan of Burgas bay.*

(Daghutli) page 174, leads eastward of Burgas shoals in depths of about 48 feet (14m6).

- 5 A spar buoy, surmounted by an upturned broom, is moored off the eastern side of Burgas shoals, about  $1\frac{1}{2}$  miles eastward of Nos Burgas ( $42^{\circ} 29' N.$ ,  $27^{\circ} 29'$ ).

**Anchorage.**—The best anchorage is reported to be situated about half a mile south-westward of the light-structure at the head of the eastern mole where there are charted depths of about 31 feet (9m4).

- 10 Deep-draught vessels may obtain anchorage in depths of from 36 to 39 feet (11m0 to 11m9), about  $2\frac{1}{2}$  cables south-eastward of the head of the eastern mole of Burgas harbour. The bay is open eastward and winds from that quarter raise a heavy swell and a short sea; if these winds become strong, vessels should seek shelter in one of the bays on the southern side  
15 of the gulf.

**Burgas harbour.**—**Depths.**—**Navigational aids.**—**Signal station.**—Burgas harbour is enclosed by two moles. The eastern mole extends about 5 cables south-eastward and southward from Burgas point.

- 20 The southern mole, on which are several oil tanks, extends about  $1\frac{1}{2}$  cables south-south-eastward and thence  $3\frac{1}{2}$  cables eastward. A short arm projects westward from the eastern mole, leaving an entrance about one cable wide.

- North-East quay and North quay are two deep-water quays situated in the north-eastern corner of the harbour. A short quay extends eastward  
25 from near the root of the southern mole. North-West quay lies close northward of this short quay. About one cable northward of the eastern end of North-West quay, there are two basins divided by a quay. Four vessels can berth alongside the northern side of the northern basin, and two each side of the quay separating the two basins. There are several  
30 cranes on these quays.

An oil pipe-line terminal is situated on the northern side of the southern mole, about three-quarters of a cable within its head; tankers here lie stern to the mole.

- The eastern part of the harbour is dredged to a depth of  $24\frac{1}{2}$  feet (7m5).  
35 Vessels not drawing more than  $22\frac{1}{2}$  feet (6m9) may berth alongside the North-East and North quays, where the bottom is soft mud. Vessels drawing 26 feet (7m9) berth alongside North-West quay. In 1961, extensive harbour works were in progress; it is reported that vessels with draughts of up to  $29\frac{1}{2}$  feet (9m0) would be able to lie alongside the new quays.

- 40 A buoy with a red spherical topmark is moored on the western side of the dredged area in the harbour.

The western part of the harbour is dredged to a depth of  $16\frac{1}{2}$  feet (5m0). The coal and fishing wharves, local freight and the government wharves are in this basin, which is also used by naval craft.

- 45 A light is exhibited, at an elevation of 56 feet (17m1), from a white, circular iron tower, 28 feet (8m5) in height, situated on the outer end of the eastern mole. A fog signal is sounded near the lighthouse.

- Lights are exhibited, at elevations of 33 and 32 feet (10m1 and 9m8), from white, circular, iron towers, each 22 feet (6m7) in height, situated,  
50 respectively, on the head of the southern mole, and on the end of the spur extending westward from the eastern mole. A signal station is situated close westward of the former light-structure.

- A conical buoy, painted in black and white stripes, surmounted by two cones, base to base, is moored half a cable west-north-westward of the head  
55 of the eastern mole; a mooring buoy is moored close westward of the conical buoy.

*Chart 2399, plan of Burgas bay.*

**Pilotage.**—Pilotage is compulsory for merchant vessels.

**Storm signals.**—Storm warning signals are displayed from the signal station on the head of the southern mole, in accordance with the U.S.S.R. system; *see* page 19. 5

**Town.**—**Port facilities.**—In 1967, the population was 106,127.

The climate in the town is good, but malaria is prevalent in the neighbourhood. There is a government hospital in the town.

A small quantity of local coal may be available.

Fuel oil can be supplied with about 5 days notice. 10

Fresh provisions are plentiful and water is laid on to the quays.

There are electric cranes of 3, 5, 10 and 15 tons capacity at various quays.

There is a floating sheerlegs with 100 tons capacity.

There are facilities for mechanised cargo handling. 15

Minor repairs can be executed.

There are tugs with horse power of 350.

The deep-water berths are connected to the general railway system.

**Radio station.**—There is a radio station at Burgas ( $42^{\circ} 29' N.$ ,  $27^{\circ} 29' E.$ ); *see* page 26. 20

**Industry and Trade.**—The timber and salt industries are thriving in the neighbourhood.

The principal exports are grain, flour, bran, cattle, hides and tobacco.

**De-ratting.**—De-ratting can be carried out; *see* page 27.

*Chart 2230.*

**NOS EMINE TO VARNA BAY.**—**Anchorage.**—**Navigational aids.**—**Local magnetic anomaly.**—The coastal mountains of the Balkan range, known to the Bulgarians as Stara Planina, in the vicinity of Nos Emine (page 177), slope steeply to the sea and are the highest land near this part of the coast. 30

Nos Kotsan ( $42^{\circ} 46' N.$ ,  $27^{\circ} 54' E.$ ), about 4 miles northward of Nos Emine, is steep and wooded on its southern side. Between these two points is a sandy valley through which a stream flows at times.

In fine weather anchorage can be obtained, in depths of from 42 to 60 feet (12m8 to 18m3), abreast the valley between Nos Emine and Nos Kotsan. 35

Northward of Nos Kotsan the coast is wooded and moderately high but becomes lower towards the mouth of a stream which flows through Obzor valley, about  $3\frac{1}{2}$  miles northward. The village of Obzor (Keoschek) is situated on the southern side of the valley and is visible from an offing. 40

Anchorage, with some shelter from north-westerly winds, can be obtained abreast the village of Obzor, in depths of from about 54 to 66 feet (16m5 to 20m1).

Nos Sveti Atanas ( $42^{\circ} 50' N.$ ,  $27^{\circ} 56' E.$ ), about 5 miles northward of Nos Kotsan, is prominent and has a large clump of trees near its extremity. 45  
The village of Byala (Aspro) lies in a valley about  $1\frac{1}{2}$  miles north-westward of the cape and above the village there is a prominent wooded hill; between this valley and Nos Byala (Aspro), about 2 miles northward of Nos Sveti Atanas, the coast is white in appearance, but Nos Byala itself is dark in colour and its slopes are covered with trees and brushwood. 50

A light is exhibited, at an elevation of 107 feet (32m6), from a stone tower, situated on Nos Sveti Atanas.

In 1880, foul ground was reported to extend about three-quarters of a mile off Nos Byala, and a rock, with a depth of less than 6 feet (1m8) over it, lies about half a mile eastward of Cherniyat Nos (Kara burnu) ( $42^{\circ} 56' N.$ , 55



*Chart 2230.*

27° 54' E.) which is situated about 2½ miles northward of Nos Byala. Vessels should not approach within 2 miles of the coast in this vicinity.

A local magnetic anomaly has been reported in the vicinity of Cherniyat  
5 Nos.

Reka Kamchiya (Kamchy) flows into the sea about 7½ miles northward of Nos Byala. This river winds through the northern edge of a broad, wooded plain which here forms a break in the coastal hills and white cliffs; it has a shallow bar but flows throughout the summer. A low hill, covered  
10 with much brushwood, rises a short distance from the northern bank of the river.

A shoal, consisting of rock and gravel, with depths of 15 feet (4m6) over it and greater depths within, lies about half a mile off the mouth of Reka Kamchiya.

15 A light is exhibited from a square metal tower, 20 feet (6m1) in height, situated on the northern side of the mouth of Reka Kamchiya.

During summer, good anchorage can be obtained, in a depth of 60 feet (18m3), mud, about 1½ miles off the mouth of Reka Kamchiya. Large vessels should not approach within one mile of the river mouth on account  
20 of the shoal described above.

From the mouth of Reka Kamchiya, the coast trends north-north-eastward for about 10½ miles to Nos Galata.

*Charts 2285, plan of Varna; 2230.*

A light is exhibited, at an elevation of 213 feet (64m9), from a white, circular, concrete tower and dwelling, 30 feet (9m1) in height, situated  
25 on the north-eastern extremity of Nos Galata. A fog signal is sounded from the lighthouse.

A rectangular, framework beacon, 49 feet (14m9) in height, stands on a hillside, about 3½ miles northward of the mouth of Reka Kamchiya.

30 A beacon, consisting of a wooden framework pyramid, 115 feet (35m0) in height, stands about 2½ miles south-westward of Nos Galata.

**Area dangerous due to mines.**—See caution on pages 13 and 170.

*Chart 2285, plan of Varna.*

**VARNA BAY AND PORT.**—**Aspect.**—**Navigational aids.**—Varna bay is entered between Nos Galata (43° 10' N., 27° 57' E.) and Nos Georgi (Cape St. George) about 4 miles north-eastward.

When approaching from north-eastward, the land southward of the bay appears as a long narrow ridge with its extremities sloping to the sea; this ridge is much lower than the land northward. Nos Galata can be  
40 easily identified from 16 miles eastward; it is steep and high and is covered with cultivated fields which give it a bright colour in comparison with the darker colour of the trees which cover the coast southward. There is a signal station on the north-eastern extremity of the cape, close northward of the lighthouse.

45 Nos Galata light is described above.

The northern side of the bay is backed by mountainous land gradually sloping westward, and the land within the southern side is also moderately high and slopes in the same direction. At the head of the bay is Varnansko ezero (Lake Devno), the wide estuary of Reka Devno, the lake is connected  
50 to the sea by a canal (see below) and is separated by a neck of marshy land about one mile wide. See view on chart 2285.

Evksinograd (Euxinograd) bay is entered westward of Nos Dimitur (St. Demetri), (43° 13' N., 27° 59' E.), which is situated about half a mile west-south-westward of Nos Georgi. A breakwater extends westward from  
55 the eastern entrance point of Evksinograd bay and shelters the landing

*Chart 2285, plan of Varna.*

place for the former royal summer palace, a prominent building with a tower, situated close within Nos Dimitur. The bay is gradually silting up.

The town and harbour of Varna lie at the north-western side of the head of Varna bay. The cathedral, in the centre of the town, is prominent. 5

**Light-buoy.**—A light-buoy exhibiting a *green flashing* light is moored about 21 miles eastward of Nos Galata lighthouse.

**Dangers.**—**Navigational aids.**—In the southern part of Varna bay about 8 cables north-westward of Nos Galata, there is an area of foul ground with two shoals with depths of 15 and 25 feet (4m6 and 7m6); 10 there are some other rocks with depths of 25 feet (7m6) within a distance of about 2 cables from these two shoals. These shoals are so small that it is possible that the least depths over them have not been ascertained; the nature of the bottom in their vicinity appears to be rock, thinly covered with sand. 15

A light is exhibited from the stern of an above water wreck, situated about 6 cables south-eastward of the head of the south-eastern breakwater of Varna harbour; a pillar buoy is moored about 1½ cables westward of this wreck.

**Anchorage.**—**Prohibited area and anchorage.**—Varna bay 20 affords anchorage, with good holding ground consisting of mud and sand, and is well sheltered from all but easterly winds, which, it is said, seldom blow home.

The best anchorage in the bay is eastward of the eastern breakwater in depths of about 42 feet (12m8). Fishing nets with stakes are occasionally 25 laid out eastward of the breakwater and extend about 1½ cables seaward from it.

Vessels capable of passing through the canal may anchor in Varnansko ezero in depths of 30 to 60 feet (9m1 to 18m3).

An area prohibited for navigation and anchoring is indicated on the 30 chart off the northern shore of the bay with its centre about 1½ miles west-south-westward of Evksinograd breakwater. An area prohibited for anchoring lies with its centre 2½ cables westward of the prohibited area and is also indicated on the chart.

Anchorage is prohibited in an area, indicated on the chart by pecked 35 lines, immediately outside the entrance to Stalin harbour.

**Harbour.**—**Quays.**—**Depths.**—Varna harbour is formed by two breakwaters; the eastern extends about 6 cables southward from the shore and has a short arm on its western side; the western extends eastward from the shore at the head of the bay, leaving an entrance about one cable 40 wide between the two breakwaters.

The eastern and northern sides of the harbour are bounded by wharves. A quay, about 300 feet (91m4) wide, extends 1½ cables south-south-eastward in the north-western corner of the harbour; in 1966 a basin, about 1½ 45 cables in extent, was under construction on the western side of the harbour, its entrance lying 2 cables westward of the head of this quay. The quay and wharves are connected to the railway system.

A naval base is situated at the root of the western breakwater, and naval vessels berth on the northern side of this breakwater.

In 1965, it was reported that there was a berth for ore carriers on the 50 western side of the harbour, at which ships of up to about 30-foot (9m1) draught could berth. In 1966, it was reported that ships of 26-foot (7m9) draught appeared to be able to berth at most of the wharves within the harbour.

**Storm signals.**—Storm warning signals are displayed from the head of 55

*Chart 2285, plan of Varna.*

the eastern breakwater, in accordance with the U.S.S.R. system; *see* page 19.

**Navigational aids.**—A light is exhibited, at an elevation of 48 feet (14m6), from a white circular metal tower, 28 feet (8m5) in height, situated on the head of the eastern breakwater (43° 11' N., 27° 55' W.). A fog signal is sounded from this lighthouse.

Lights are exhibited, at elevations of 32 and 33 feet (9m8 and 10m1), from white circular metal towers, each 21 feet (6m4) in height, situated on the eastern and western sides, respectively, of the entrance to the harbour.

**Canal.**—A canal, reported, in 1949, to be dredged to a depth of 26 feet (7m9) and available for vessels of 24-foot (7m3) draught, has been cut through the neck. Its entrance is formed by training walls, the southern of which extends about 3 cables offshore, its outer part being submerged. There are several landing stages on either bank of the canal and it is crossed by a pontoon bridge.

There is a tanker berth alongside the training wall on the southern side of the entrance to the canal, and some oil tanks are situated near the root of this wall.

**Pilotage.**—It was reported, in 1966, that pilots, who must be requested in advance, meet vessels off Nos Kaliakra (page 185) and conduct them to the anchorage, where clearance formalities are carried out before the vessel can enter harbour.

**Varna.—Port facilities.**—The town of Varna (43° 12' N., 27° 55' E.), with a population, in 1967, of 180,062, is situated on a plateau sloping gently to the head of the bay. High minarets show here and there above small white houses surrounded by verdure. The most prominent building in the town is the Bulgarian cathedral, which has six cupolas, and a black, circular water-tower about 1½ miles east-north-eastward of the cathedral is also a good landmark. There are a number of hospitals in the town.

It is the principal port of Bulgaria and is used for goods in transit to and from the Balkan countries.

Fuel oil is available.

Some coal is obtainable.

Fresh provisions are available. Water is laid on to the wharves.

There is a small dry dock and a floating dock; *see* Appendix I.

Small repairs to machinery can be executed.

The wharves are equipped with about eighteen 3- to 5-ton cranes; there are floating cranes of 40 and 100 tons capacity.

In 1965, it was reported that there were several powerful tugs.

**Regulations.**—The following are extracts from the regulations in force in 1956:—

1. Entry and departure of vessels is regulated from the signal station on the eastern mole.

2. Entry and departure from the port at night is forbidden.

3. At least 2 hours notice must be given for entering the harbour:

**Signals.**—The following signals (on opposite page) govern the movement of vessels.

**Trade and Shipping.—Communications.**—There is regular sea communication between Varna and the principal ports of the Black sea and Mediterranean. The town is connected with the general railway system. There is an airport near the town.

The principal exports are grain, tallow, hides, sheep, cheese, dried beef and wool; the chief imports are manufactured articles, machinery, oil, pig iron and coal.

Signal Number	Type of signal		Meaning
	By day	At night	
1	3 black balls, vertically displayed.	3 red lights, vertical.	Port closed.
2	Black cone point up, between two black balls.	White light between two red lights.	Entrance prohibited; Exit permitted.
3	Black cone, point up, between two black cones point down.	White light between two green lights.	Entrance permitted; Exit prohibited.
4	Black ball, surmounted by two black cones points together.	White light between one green and one red light.	Both entrance and exit prohibited.

**Radio station.**—There is a radio station at Varna, *see* page 26.

**De-ratting.**—De-ratting can be carried out; *see* page 27.

**Climatic table.**—*See* page 73.

#### Chart 2230.

**NOS GEORGI TO NOS KALIAKRA.**—**Aspect.**—Between Nos Georgi and Nos Kaliakra ( $43^{\circ} 22' N.$ ,  $28^{\circ} 28' E.$ ), about 22 miles east-north-eastward, the coast is backed by a narrow mountain range which at first is moderately flat but later becomes undulating. This range is broken by the valley of Balchik (Baljik), about 12 miles north-north-eastward of Nos Georgi and it thence becomes narrower as it approaches Nos Kaliakra; Balchik valley lies at the western extremity of some chalk cliffs by which it can easily be identified. Near Kavarna about 9 miles eastward of Balchik, there is a deep ravine in the middle of which is an isolated, triangular hillock, easily identified from anywhere in the offing. *See* view [8].

Nos Kaliakra is remarkable for its prominence as well as from its marking the boundary between the high land described above and the lower land northward. For over 100 miles southward of Nos Kaliakra, the western shore of the Black sea is mountainous, but northward of this cape, and for the whole distance to Odessa, about 200 miles, north-north-eastward, the aspect of the coast changes to a moderate elevation and level surface, with only slight indentations affording little shelter.

**Nos Kaliakra.**—**Navigational aids.**—Nos Kaliakra is the southern extremity of a peninsula about 4 cables long, with sloping sides of a reddish colour; from some distance eastward, this peninsula appears to be isolated from the higher mainland northward; *see* Appendix III.

A light is exhibited, at an elevation of 220 feet (67m), from a white, stone tower on a dwelling, 26 feet (7m) in height, situated on Nos Kaliakra. A radiobeacon transmits from the lighthouse and a fog signal is sounded from a position close southward.

**Nos Georgi to Nos Balchik.**—**Coast.**—**Dangers.**—**Navigational aids.**—**Anchorages.**—From Nos Georgi the coast trends north-north-eastward for about 7 miles to Nos Ekrene ( $43^{\circ} 19' N.$ ,  $28^{\circ} 05' E.$ ) the southern entrance point of Batova bay. Monastery or Chingani reef,

*Chart 2230.*

consisting of several rocky patches with depths of from 3 to 4 feet (0m9 to 1m2) over them, extends about half a mile offshore between 2 and 3 miles north-eastward of Nos Georgi. The area for about half a mile seaward of these patches is shallow, and vessels should not approach within 1½ miles of the coast abreast or northward of them. The western end of the summit of Mount Galata, the highest flat hill on the southern side of Varna bay, situated about one mile west-south-westward of Nos Galata, bearing 227° and open a little eastward of Nos Georgi, leads eastward of this reef.

From the northern end of Monastery reef, for about 10 miles north-north-eastward to the village of Balchik (Baljik), the coast is fringed by a bank with depths of less than 30 feet (9m1), and in places, of only from 6 to 12 feet (1m8 to 3m7) on it, which extends from half a mile to one mile offshore. The outer edge of this bank is marked by a spherical light-and-whistle-buoy, exhibiting a *red flashing* light *every two-and-a-half-seconds*, moored, 3½ miles north-north-eastward of Nos Georgi, and by a conical buoy moored about 1½ miles farther northward.

A black mooring buoy lies about 6½ miles north-eastward of Nos Georgi. A beacon consisting of a rectangular framework shield, 49 feet (14m9) in height, stands about 2½ miles northward of Nos Georgi, 1½ miles inland. *Chart 2285, plan of Baljik bay.*

Batova bay is entered between Nos Ekrene (43° 19' N., 28° 05' E.) and a point about 4 miles farther north-north-eastward. Within the head of the bay is a thickly-wooded and very swampy plain, across which westerly winds blow with considerable strength.

A light is exhibited at an elevation of 373 feet (113m7) from a white square tower with a yellow dwelling, 39 feet (11m9) in height, situated on Nos Ekrene.

There is anchorage in Batova bay, in depths of about 48 feet (14m6), about 1½ miles offshore.

Balchik (Baljik) bay, at the head of which is a village of the same name, is entered westward of Nos Balchik (Baljik), situated about 12 miles westward of Nos Kaliakra.

A light is exhibited, at an elevation of 33 feet (10m1) from a tower, 25 feet (7m6) in height, situated on the head of a pier about one mile westward of Nos Balchik.

A wooden, framework, pyramidal beacon, 59 feet (18m0) in height, stands about 4 cables east-north-eastward of the root of the pier.

Cargoes of vessels are transported by lighters. The village of Balchik is connected with the general railway system.

Balchik bay serves as a refuge for vessels not only during northerly winds in winter months, but in all bad weather; the bay is open to south-easterly winds but it is stated locally that these winds never blow home.

The worst winds are those from off the valley, between west and north-west, and, at times, anchorage close inshore is unsafe.

The best anchorage berth in Balchik bay is in depths of from 33 to 36 feet (10m1 to 11m0), mud, southward of the village and about three-quarters of a mile from the head of the bay. There is also good anchorage for a large number of vessels, sheltered from the prevailing winds, in depths of from 48 to 54 feet (14m6 to 16m5), tough clay, gradually shoaling to the shore.

*Chart 2230.*

**Nos Balchik to Nos Kaliakra.—Navigational aids.—Anchorages.**—Between Nos Balchik and Nos Kaliakra, about 13 miles eastward, the coast forms a slight bight, at the head of which, about 8 miles eastward

*Chart 2230.*

of Nos Balchik, is Kavarna bay. There is a small pier for the use of lighters at Kavarna bay; in 1924, the pier had a depth of 8 feet (2m4) alongside its outer end.

A light is exhibited, at an elevation of 16 feet (4m9), from a black iron column situated on the head of the pier at Kavarna bay; a light is also exhibited from the root of the pier. 5

A wooden, framework, pyramidal beacon, 59 feet (18m0) in height, stands on the coast about 3 miles north-westward of Nos Kaliakra (43° 22' N., 28° 30' E.). 10

Anchorage is charted, in depths of about 54 feet (16m5), about one mile southward of Kavarna light.

Anchorage can be obtained, in a depth of 42 feet (12m8), mud, southward of the framework pyramidal beacon and about 2½ miles westward of Nos Kaliakra. Nos Kaliakra is fringed by a reef which should be given a berth 15 of at least one cable.

*Charts 2230, 2231.*

**NOS KALIAKRA TO CAPUL CONSTANȚA.—Local magnetic anomaly.**—In 1926, a local magnetic anomaly was reported to exist between Nos Kaliakra and Capul Tuzla, about 39 miles northward. 20

**Nos Kaliakra to Mangalia.—Navigational aids.—International boundary.—Dangers.**—Between Nos Kaliakra and Nos Shabla (Shableh), about 12½ miles north-north-eastward, the coast is flat and rocky with steep cliffs mostly red in colour. About midway between these capes is Kamen Bryag, a large village surrounded by tall trees which are prominent. About 25 one mile southward of this village and standing in a clump of trees close to the edge of the cliff, is a white coastguard station with a red roof surmounted by a red framework diamond. There are some smaller villages, also surrounded by trees, on this stretch of coast. 30

From a distance, Nos Shabla is not prominent; there is a moderately large hillock within it which, by approaching vessels, will be seen before the lighthouse. The large village of Shabla (Shableh), which is surrounded by trees, lies about 3 miles within the cape but is only visible from north-eastward. 35

Nos Shabla light is exhibited, at an elevation of 118 feet (36m0), from an octagonal stone tower, painted in red and white bands, 100 feet (30m5) in height, situated on Nos Shabla. 35

A wooden, framework, pyramidal beacon, 66 feet (20m1) in height, stands about three-quarters of a mile westward of Nos Shabla. 40

*Chart 2231.*

Between Nos Shabla and Mangalia, about 16 miles northward, several villages can be seen, the most important of which are Krapets (Kartolia), situated about 5½ miles north-north-westward of Nos Shabla with a clump of tall trees near it, and Vama Veche (Ilanlik), which has only a few trees near it, about 7½ miles farther northward. 45

Two shallow lakes, Shablensko ezero and Blatnishko blato, each separated from the sea by narrow necks of land are situated respectively about 3 and 9 miles north-north-westward of Nos Shabla.

The International boundary between Bulgaria and Rumania reaches the coast close southward of Vama Veche (43° 45' N., 28° 35' E.). 50

A reef, on which the sea breaks in any swell, extends about 1½ cables offshore abreast Nos Shabla, and another reef extends up to 3 cables offshore abreast the hillock near that cape.

Three rocky shoals, each with a depth of 27 feet (7m8) over it, lie,

*Chart 2231.*

respectively, about  $1\frac{1}{2}$ ,  $5\frac{1}{2}$  and  $8\frac{1}{2}$  miles northward of Nos Shabla and about three-quarters of a mile,  $1\frac{1}{2}$  and  $1\frac{1}{2}$  miles offshore.

A rock with a depth of 7 feet (2m1) over it, lies about  $10\frac{1}{2}$  miles northward of Nos Shabla and about half a mile offshore, and about  $2\frac{1}{2}$  miles farther northward there is a 30-foot (9m1) shoal about  $1\frac{1}{2}$  miles offshore.

Foul ground extends off this stretch of coast in other places and vessels should give it wide a berth.

*Chart 2285, plan of Port Mangalia.*

10 **Mangalia.**—The town on Mangalia ( $43^{\circ} 49' N.$ ,  $28^{\circ} 35' E.$ ), may be identified by some small hills near it; by two tall minarets, the northern minaret being the taller; by a church with a white tower and a green roof which is prominent; and by the northern of two moles forming a harbour, which stands out well against the sandy beach behind it.

15 Mangalia is a popular Rumanian watering-place, situated on the eastern end of Lacul Mangalia.

The northern mole extends east-south-eastward and south-south-eastward for about  $2\frac{1}{2}$  cables on a shallow spit abreast the town; the southern mole extends about one cable eastward from the shore about  
20  $3\frac{1}{2}$  cables south-westward of the root of the northern mole. Small craft can obtain shelter between these moles where, in 1956 there were depths of from up to 15 feet (4m6).

*Chart 2231.*

**Navigational aids.—Dangers.**—Mangalia main light is exhibited at  
25 an elevation of 235 feet (71m6) from a white square stone tower, 136 feet (41m4) in height, situated about one mile west-north-westward of the port.

*Chart 2285, plan of Port Mangalia.*

A light is exhibited, at an elevation of 26 feet (7m9), from a framework pylon with a hut, situated on the head of the northern mole.

30 A shoal, on which there are some rocks awash, lies about half a mile offshore with its northern end, which is marked by a black buoy, about half a mile southward of the head of the northern mole.

A rock, awash, lies about  $1\frac{1}{2}$  cables east-north-eastward of the head of the northern mole, and there are depths of less than 12 feet (3m7) between  
35 this rock and the mole.

The two buoys are moored on the northern side of the entrance to the harbour, about one cable southward, and  $3\frac{1}{2}$  cables south-westward, respectively of the head of the northern mole. None of these buoys should be relied upon.

40 **Current.**—The current sets southward along the shore at a rate of about half a knot in ordinary weather and extends about 3 miles offshore; its outer limit can be distinguished as the water forming it is darker in colour than the sea water farther offshore.

**Anchorage.**—Vessels usually anchor, in a depth of 48 feet (14m6)  
45 about one mile offshore eastward of the town, but the best berth for a small vessel not proceeding alongside the moles is in depths of from 24 to 30 feet (7m3 to 9m1), about 3 cables southward of the head of the northern mole.

**Prohibited area.—Caution.**—An area prohibited to navigation and  
50 anchoring by foreign vessels exists in the approach to Mangalia. The limits of the area are bounded by the shore and by lines joining the following positions.—

1. Lat.  $43^{\circ} 53' N.$ , Long.  $28^{\circ} 36.5' E.$
2. Lat.  $43^{\circ} 53' N.$ , Long.  $28^{\circ} 45.0' E.$
- 55 3. Lat.  $43^{\circ} 45' N.$ , Long.  $28^{\circ} 45.0' E.$
4. Lat.  $43^{\circ} 45' N.$ , Long.  $28^{\circ} 34.8' E.$

*Chart 2231.*

**Mangalia to Capul Constanța.—Navigational aids.—Dangers.**—From Mangalia the coast trends north-north-eastward for about 11½ miles to Capul Tuzla. A pyramidal beacon, surmounted by two red and white flags, stands on the coast about 2½ miles northward of Mangalia. 5

Capul Tuzla is sloping and of moderate elevation. Some rocks lie a short distance off this cape.

A light is exhibited, at an elevation of 203 feet (62m0) from a black and white metal tower, 144 feet (43m9) in height, situated on Capul Tuzla. An auxiliary light is exhibited, at an elevation of 187 feet (57m0), from the same tower. A fog signal is sounded from the lighthouse. This lighthouse is in telephonic communication with Constanța and is used as a lookout station. 10

From Capul Tuzla the coast trends northward for about 11 miles to Capul Constanța. For the first 3 miles there are sandhills, but about half a mile farther northward a large depression commences, in which lies Lacul Techirghiol (Tuzla), which is separated from the sea by a low sandy beach. This depression and the lighthouse on Capul Tuzla are the best landmarks in the vicinity. 15

Between Capul Tuzla (43° 59' N., 28° 40' E.) and Capul Constanța shallow banks extend more than one mile offshore in places and this stretch of coast should be given a berth of a least 2 miles. 20

About 3 miles southward of Capul Constanța a rocky spit, with depths of less than 30 feet (9m1) on it, extends about 1½ miles offshore; on this spit there are depths of only 9 feet (2m7) about 3 cables offshore. The spit is covered by the red sector of Capul Tuzla light between the bearings of 162° and 192°. 25

For the light about one mile south-south-westward of Capul Constanța, see page 191.

**Measured distance.—Beacons.**—A measured distance marked by three pairs of beacons, the beacons of each pair disposed in an east-west direction, exists in the vicinity of Capul Tuzla. The front beacon of the southern pair stands about 1½ miles south-south-westward of Capul Tuzla lighthouse, with the rear beacon about 8 cables westward of it. The front beacon of the central pair stands 2 cables south-south-westward of the lighthouse, with the rear beacon about one mile westward of it. The front beacon of the northern pair stands about 9 cables north-north-westward of the lighthouse, with the rear beacon about 5 cables westward of it. All the beacons are four-sided metal structures, and all are painted in black and white chequers, with the exception of the rear beacon of the northern pair which is painted in black and white bands and carries a topmark. The probable courses are north/south, over a total distance of about 2½ miles. 30 35 40

**CAUTION.**—Attention is drawn to areas off Mangalia and Constanța which are dangerous on account of mines; See NEMEDRI and page 13. 45

Vessels are advised not to enter the port of Mangalia at night.

*Charts 2231; 2284, plan of Constanța.*

**CONSTANȚA AND APPROACHES.—Aspect.—Swell.**—The city of Constanța (44° 10' N., 28° 39' E.) is built on a low promontory which extends about half a mile eastward from the general line of the coast and terminates in Capul Constanța and which partly shelters the harbour southward. A conspicuous white house with a grey roof stands on the cliff about 2½ miles farther southward. Vessels approaching from eastward will first identify the oil tanks, which are situated about one mile south- 50



*Charts 2231; 2284, plan of Constanța.*

westward of the city; other good landmarks are the grain elevators situated on Grain quay, *see* below, about midway between the oil tanks and city; a white casino on the coast about  $1\frac{1}{2}$  cables south-south-westward  
 5 of Capul Constanța; and, close within the cape, a large hotel, painted light yellow.

During gales a heavy swell is raised in the roadstead; this continues after the storm has passed, and causes vessels lying there to roll heavily.

**Danger in approaches.**—The dangers in the southern approaches  
 10 are described on page 189.

A 30-foot (9m1) shoal is indicated on the chart about  $2\frac{1}{2}$  miles south-eastward of Capul Constanța. *See* Appendix III.

Several rocky patches, with depths of less than 30 feet (9m1), lie up to  $1\frac{1}{2}$  miles off the coast between Capul Constanța and Capul Singhol, about  
 15  $2\frac{1}{2}$  miles northward. In 1921, the S.S. *Yarborough*, drawing 11 feet (3m4), reported striking an obstruction about  $1\frac{1}{2}$  miles eastward of Capul Singhol.  
*Chart 2284, plan of Constanța.*

Capul Constanța is fringed by an irregular rocky bank with depths of less than 36 feet (11m0) which extends about 6 cables east-north-eastward  
 20 from the cape. A patch of foul ground lies about one mile east-south-eastward of Capul Constanța. *See* Appendix III.

**Harbour.—Wharves.—Depths.**—The port of Constanța is made up of three harbours: the outer harbour; the inner or Main harbour, and Portul Turistic Tomis.

25 The Outer harbour is included between two breakwaters, the southern of which extends  $2\frac{1}{2}$  cables eastward and  $11\frac{1}{2}$  cables east-north-eastward from a position on the mainland 12 cables south-westward of the head of the Eastern breakwater. The eastern side of the Outer harbour is protected by a breakwater which extends 7 cables south-eastward and then  
 30 6 cables southerly from a position 2 cables northward of the head of the Eastern breakwater. Entrance is obtained between the head of the southern breakwater and a short spur extending westward from a position about  $2\frac{1}{2}$  cables northward of the head of the outer breakwater.

A jetty extends southward for about three-quarters of a cable into the  
 35 outer harbour, from the old southern breakwater.

The Main harbour is formed by two breakwaters; the old southern breakwater which extends south-eastward, eastward, and north-eastward for about  $5\frac{1}{2}$  cables from a position about 11 cables south-westward of Capul Constanța; and the Eastern breakwater which extends about 7  
 40 cables southward from the southern extremity of the town and has a short arm, about 2 cables within its extremity, projecting towards the southern breakwater, leaving an entrance channel 175 yards (160m0) wide.

Three basins are situated on the western side of the Main harbour. The southernmost, Bazinul de Petrol ( $44^{\circ} 10' N.$ ,  $28^{\circ} 39' E.$ ), lies between  
 45 the southern breakwater and an unnamed mole northward of it; Noul Bazinul de Petrol lies between the unnamed mole and New mole close northward, and the northernmost basin lies between New and North moles close northward.

The northern part of the harbour is entered between the head of North  
 50 mole and the head of New jetty about  $1\frac{1}{2}$  cables north-eastward, and comprises Grain quay on the western side, North quay on the northern side and an unnamed quay on the eastern side. The port office is situated on the latter quay.

Bazinul de Petrol is reported to be difficult of access with a fresh  
 55 breeze blowing, and vessels are recommended to be well ballasted and have good hawsers ready. The tugs belonging to the port are available.

*Chart 2284, plan of Constanța.*

The turnings into this basin are awkward, and the corners of the projecting arms are square blocks of masonry which are liable to cause damage to the sides of a vessel when entering. This basin has depths of 27 to 31 feet (8m2 to 9m4). In 1964, it was reported that there was a least depth of 29 feet (8m8). The bottom is soft mud. There are 10 fuel loading points on the northern side of the basin, of which 3 can supply up to 3,000 tons per hour. The entrance to this basin can be closed by a floating pontoon bridge. Berths in this basin are lettered A, B and C on the northern side, and F, E and D on the southern side, from eastward.

Noul Bazinul de Petrol has depths of 27 to 31 feet (8m2 to 9m4). In 1964, it was reported that there was a least depth of 28 feet (8m5) in this basin. The basin is used for the initial lightening of deep draught vessels.

In the basin between New mole and North mole there are depths of 21 to 27 feet (6m4 to 8m2), except at the western end of North mole where there is a depth of 16 feet (4m9). In 1965, it was reported that ships of up to 30-foot (9m1) draught could berth alongside the northern side of New mole.

In the northern basin there are depths of 22 to 27 feet (6m7 to 8m2). Dredging is constantly in progress in the entrance and alongside the quays.

There was, in 1962, a least depth of 30 feet (9m1) alongside Nos. 1 to 5 berths.

Berths are numbered from 0 to 38 commencing from a position close northward of the spur extending westward from the Eastern breakwater in an anti-clockwise direction to the southern side of Noul Bazinul de Petrol, and are indicated on the plan.

A recently constructed harbour, Portul Turistic Tomis, occupies a bay 2½ cables north-westward of Capul Constanța. The harbour is protected by breakwaters and the entrance, facing eastward, is half a cable wide.

**Navigational aids.**—Constanța main light (44° 09' N., 28° 38' E.) is exhibited at an elevation of 285 feet (86m9) from a white concrete tower, 190 feet (57m9) in height, situated 2 miles south-westward of Capul Constanța. A radiobeacon transmits from the light-structure.

A light is exhibited at an elevation of 72 feet (21m9) from a stone tower, painted black and white in bands, 59 feet (18m0) in height at the outer end of Eastern breakwater. A fog signal is sounded from the light tower.

A light is exhibited at an elevation of 36 feet (11m0), from a grey metal tower, 26 feet (7m9) in height, situated on the old southern breakwater head, and on the head of the transverse spur.

A light is exhibited, at an elevation of 33 feet (10m1) from the head of the outer eastern breakwater.

A light is exhibited, at an elevation of 14 feet (4m3), from the head of the outer southern breakwater.

"C", red can light-buoy exhibiting a *red flashing light every five seconds* is moored about three-quarters of a cable southward of the head of the outer eastern breakwater.

"No. 1", black can light-buoy, exhibiting a *green flashing light every three seconds* is moored close southward of the transverse spur of the outer eastern breakwater.

"No. 2", red can light-buoy, exhibiting a *red flashing light every three seconds* is moored close southward of the head of the outer southern breakwater.

Three *white fixed* obstruction lights, disposed vertically, are exhibited from the mast of the radio station, situated about 5 cables northward of the main light.

**Pilotage.**—Anchorage.—Pilotage is compulsory for all merchant vessels and is carried out by day and night.

*Chart 2284, plan of Constanța.*

Vessels should anchor from 8 cables to 2 miles east-north-eastward or east-south-eastward of the eastern breakwater lighthouse, and well clear of the leading line. In bad weather, a vessel should form a lee for the pilot  
 5 vessel in a position about 8 cables south-south-eastward of the same lighthouse.

**Prohibited anchorage.**—Anchorage is prohibited in the Outer harbour.

**Traffic signals.**—Traffic signals, affecting ships lying in the harbour or  
 10 approaching it, are displayed from a signal station situated about  $2\frac{1}{2}$  cables northward of the head of the eastern breakwater; the signals, which are disposed vertically, are as follows:—

	<i>Signals.</i>	<i>Signification.</i>
	<i>By day.</i> —3 black balls, or, 15 <i>by night.</i> —3 red lights.	} Entering or leaving the harbour is prohibited.
	<i>By day.</i> —A black cone above a black cylinder, or, <i>by night.</i> —A green light above a red light.	
	<i>By day.</i> —A black cylinder above a black cone, or, 20 <i>by night.</i> —A red light above a green light.	} Entering is prohibited; leaving is permitted.
	<i>By day.</i> —2 black cones, or, 25 <i>by night.</i> —2 green lights.	
		} Approaching or entering is prohibited.

*Charts 2284, plan of Constanța; 2214.*

**Constanța.**—The city of Constanța, which in 1966, had a population of 199,000, is a large industrial centre and a major railroad junction. It is the principal Rumanian port on the Black Sea, and is the transit port  
 30 for the whole country. It is the nearest point on the coast of the Black Sea to Cernavodă ( $44^{\circ} 22' N.$ ,  $28^{\circ} 02' E.$ ), about 35 miles westward; see also page 196.

*Chart 2284, plan of Constanța.*

**Port facilities.**—Mariners are admitted to the military hospital or to  
 35 one of several private hospitals.

A small quantity of coal is maintained and is supplied in baskets.

A large quantity of fuel oil is maintained; oil is supplied by pipeline at the rate of about 200 tons per hour at the berths just outside Bazinul de  
 Petrol.

40 Fresh meat and large quantities of fresh provisions are available.

Ample drinking water is available at the quays and is supplied at charges less than those of Odessa or Novorossisk. Water from the River Danube can also be supplied alongside some of the quays and from tank vessels; this water is only drinkable after boiling and filtering and the supply is  
 45 limited at times.

The moles and quays are connected with the general railway system.

There are several cranes of from 3 to 27 tons lifting capacity on the quays. There is a 40-ton crane on the southern side of the North mole. There is a floating crane of 100 tons lifting capacity.

50 Several tugs and a fire float are available.

There is a floating dock and three slipways at the inner end of the northern-most basin; for details, see Appendix I.

**De-ratting.**—De-ratting can be carried out; see page 27.

*Chart 2284, plan of Constanța.*

**Life-saving.**—Two motor lifeboats and a line-throwing apparatus are maintained at Constanța.

**Trade and shipping.**—The principal exports are petroleum products, grain, timber, and livestock, and the principal imports, iron scrap, iron goods, coal, provisions and fruit. 5

**Communications.**—The town is connected to the general railway system. There are regular sea services with the Danube ports, İstanbul, and various Mediterranean ports. There are also regular air services with Cernavoda, București (Bucharest), Galați (Galatz) and Cernauți (Czerno- 10 witz).

**Radio station.**—There is a radio station at Constanța, *see* page 26.

**Climatic table.**—*See* page 74.

*Chart 2231.*

**CAPUL SINGHOL TO GURA SFÂNTUL GHEORGHE.**— 15

**Dangers.**—**Navigational aids.**—Between Capul Singhol and Capul Midia ( $44^{\circ} 21' N.$ ,  $28^{\circ} 42' E.$ ), about 8 miles northward, there is a slight indentation which is free from dangers; within its shore lie Siut ghiol and Lacul Tașaul (Tashaul).

A light is exhibited, at an elevation of 118 feet (36m0) from a red tower with a white square cupola 72 feet (22m0) in height, situated on Capul Midia. 20

Between Capul Midia and Gura Sfântul Gheorghe (St. George mouth) of River Danube, about 50 miles north-eastward, there is a bight, the northern part of which is known as the anchorage of Portiței (Portiții). The village of Vadul (Karaharman) stands on rather high ground about  $6\frac{1}{2}$  miles north-north-eastward of Capul Midia and is visible from a considerable distance. North-eastward of Vadul the shore of the bight becomes low and sandy, indicating the approach to the mouths of River Danube, and within its southern part, separated from the sea by narrow sandy beaches, are several lakes. 25 30

Kituk beacon, a four-sided metal structure painted in black and white bands, stands on the coast nearly 12 miles north-north-eastward of Capul Midia light.

A shoal, with a depth of 6 feet (1m8) over it, the position of which is approximate, was reported, in 1922, to lie about  $1\frac{1}{2}$  miles east-north-eastward of Capul Midia. 35

*Charts 2835 and 2231.*

Gura Portiței (Portiții) ( $44^{\circ} 41' N.$ ,  $29^{\circ} 00' E.$ ), the southernmost mouth of River Danube, is situated about 24 miles north-eastward of Capul Midia; it is only navigable by boats. Within the mouth is the shallow Lacul Razelm. 40

Gura Portiței light is exhibited at an elevation of 79 feet (24m1) from a metal tower with a red platform, 72 feet (22m0) in height, situated on the northern side of the entrance to the river. 45

Between Gura Portiței and Gura Sfântul Gheorghe the coast is formed by the southern side of Ostrovu Dranova, which is part of the delta of River Danube and is very low.

A wooden beacon, 50 feet (15m2) in height, stands near the coast about 7 miles north-eastward of Gura Portiței. 50

Zatonul-nou beacon, a four-sided metal structure painted in black and white bands, stands on the southern coast of Ostrovu Dranova, about  $13\frac{1}{2}$  miles north-eastward of Gura Portiței light-structure.

This stretch of coast is fringed by a bank, with depths of less than 30 feet (9m1), which extends about 3 miles offshore. 55

*Charts 2835 and 2231.*

**Current.**—In the vicinity of Capul Midia a current has been observed to set northward at a rate of half a knot between the coast and depths of 42 feet (12<sub>m</sub>8), but farther offshore the main southerly set runs at a rate of from a quarter to half a knot.

*Chart 2231.*

**Anchorage.**—The anchorage of Portiței affords good shelter from northerly winds in depths of about 33 feet (10<sub>m</sub>1), mud and shell, with the five peaks of Beș tepe range (page 196), situated about 24 miles northward of Gura Portiței, bearing between 307° and 343°, from about 2½ to 3 miles offshore. The coast is low lying and hardly discernible from the anchorage.

*Charts 449, 2214.*

**RIVER DANUBE.—General Remarks.**—River Danube, called Donau in Germany, Duna in Hungary, Dunaj in Czechoslovakia, Dunav in Yugoslavia and Bulgaria, Dunărea in Rumania and Dunay in U.S.S.R., the largest river in Europe except the Volga, traverses the southern part of Germany; flows through the northern part of Austria, passing Vienna, past the Czechoslovak port of Bratislava; through Hungary, passing Budapest; through Yugoslavia, passing Belgrade; past the Rumanian ports of Brăila and Galați, the U.S.S.R. ports of Reni, Izmail and Kiliya and debouches through a delta into the Black sea after a course of about 1,750 miles.

At its source River Danube has an elevation of about 3,000 feet (914<sub>m</sub>4), and its course lies through alpine country to Ulm, where it has an elevation of 1,500 feet (457<sub>m</sub>2) and is about 300 feet (91<sub>m</sub>4) wide; at Ulm, River Iller joins River Danube and it becomes navigable for flat-bottomed boats of 100 tons.

At Donauwörth (48° 43' N., 10° 46' E.) 40 miles below Ulm, River Danube is 180 yards (164<sub>m</sub>6) wide and steam navigation begins, as power-driven vessels ply daily, from May to September, between Donauwörth and Regensburg. Between Neustadt and Regensburg the river forces its way through a narrow, cliffy defile nearly one mile in length. At the eastern end of the defile is Kelheim, at the junction of River Altmühl with River Danube, and as the Ludwig canal connects River Altmühl with River Main at Bamberg, it is possible to traverse the European continent, by water, from the North sea to the Black sea.

At Passau, in Bavaria, the Inn river joins River Danube, which here has an elevation of 800 feet (243<sub>m</sub>8), is 220 yards (201<sub>m</sub>2) in width, and 23 feet (7<sub>m</sub>0) deep; power-driven vessels ply regularly in summer, between Passau and Vienna. Below Passau, the right bank of the river is Austrian and the left Bavarian as far as Engelhartszell, just above which a reef of rocks causes a rapid.

Below Engelhartszell the valley of River Danube becomes wider, but about half way between that town and Aschach it is contracted by a second defile, which causes much commotion in the river. Between Aschach and Linz there is an archipelago, and the channel of the river is so constantly changing that navigation is intricate. Before reaching Linz River Danube passes through a chain of mountains which descend to the river in steep cliffs. At Linz the river is crossed by a bridge.

From Linz the distance by the river to Vienna is 126 miles, and power-driven vessels take 8 or 9 hours when proceeding downstream, and 18 to 20 hours in the reverse direction. Below Grein, River Danube passes through a chain of gigantic hills and forms a rapid named Greiner Schwall. At Mantern, about two thirds of the way from Linz to Vienna, a wooden bridge crosses the river.

*Charts 449, 2214.*

The minimum depth between Passau and Vienna is four feet (1m2), when the river is low, excepting at Fischameat Thabea rapids, where it is 3 feet (0m9).

From Vienna (48° 13' N., 16° 21' E.) the Danube flows eastward for 150 miles, through a wide expanse of flat country to Vacz, and then turns southward to Budapest, 182 miles below Vienna. Between Vienna and Bratislava the river is split up into numerous narrow channels, but from Bratislava to Budapest, viz., at Esztergom, it is again shut in by high land, and, being here a wide expanse of water, looks more like a lake than a river. Power-driven vessels occupy about 13 hours on the voyage from Vienna to Budapest.

At Budapest the river is spanned by a suspension bridge, beneath which River Danube, which is 54 feet (16m5) deep, flows at a rate of from 7 to 8 knots. A harbour at Budapest consists of three basins, with a minimum depth of 10 feet (3m0).

From Budapest to Belgrade, River Danube runs southward and east-south-eastward for about 310 miles, with numerous windings and widens out, occupying a bed disproportioned to the volume of its waters, and the navigation is consequently constantly impeded by shallows and shifting beds of sand and gravel. The river Sava (Save) joins River Danube at Belgrade, and the Tisa joins the latter river some few miles northward.

From Belgrade to Orșova, in Rumania, River Danube flows nearly due east. At Moldova it enters a series of rocky gorges, and after sweeping through a succession of deep pools and shallow rapids, confined within the passes of Stenka, Islaz, and Kasan (i.e. Cauldron), finally reaches its last and most formidable rapids, called the Iron Gates (44° 42' N., 22° 32' E.), situated about 85 miles eastward of Belgrade, and 632 miles by river from Vienna. The Iron Gates, 6 miles below Orșova, are nearly one mile in length, and are so named, not from the surrounding heights, which here slope gradually to the river, but from the number of submerged rocks in the waterway; the extreme variations between high and low river are 14½ feet (4m5) at the upper end, and 22½ feet (6m9) at the lower end of the Iron Gates. A canal, on the Yugoslavia side of the river, commencing abreast Orșova, enables vessels to avoid these rapids and allows traffic to continue throughout the year, except when interrupted by ice.

It is reported, in 1969, that when development works now in hand, are completed the annual tonnage of shipping using this route will be increased from about 12 million to 90 million tons.

The general width of River Danube between Vienna and the Iron Gates is from 2,000 to 6,000 feet (609m6 to 1,828m8) when the river is low, and from 7 miles to 30 miles when the river is high, but there are exceptions to this, viz., at 50 miles above Belgrade, the width is 800 feet (243m8); and at Kasan pass, a pass 5½ miles in length, 600 feet (182m9); but in those places the depth is greatly increased, being 40 feet (12m2) at the first named, and 80 feet (24m4) at Kasan pass, when the river is low; the difference between high and low river at Kasan pass is about 23 feet (7m0).

The mean velocity of the current from Vienna to the Iron Gates is from 2 to 3 knots, but in the narrow defiles it attains a rate of 8 knots at high floods.

From Turnu Severin, 8 miles below the Iron Gates, to Orșova, navigation is confined to river vessels, tugs and barges drawing 6 feet (1m8); thence to Vienna the draught is limited to 5 feet (1m5), and from Vienna to Regensburg to a somewhat lower figure. Barges of 600 tons can be towed from the lower Danube to Regensburg.

*Charts 449, 2214.*

**Lower Danube.**—The lower Danube commences at the lower end of the Iron Gates, 570 miles by river from the Black sea.

- The width of River Danube at Turnu Severin is 3,000 feet (914m4), and its maximum depth is 18 feet (5m5). From here to Vidin, 83 miles, its course is tortuous, and generally in a southerly direction, but from Vidin to Cernavodă (Chernavoda) its course is in a general easterly direction for 300 miles, and at Cernavodă the width of the main river is 2,000 feet (609m6), and its depth, when low, 28 feet (8m5), the extreme variation between high and low river being 23 feet (7m0); when the river rises 18 feet (5m5) above its low level, the whole country is inundated, and the swollen waters extend across to the village of Fetesti 8½ miles distant. From near the village of Negotin, about 15 miles north-westward of Vidin, until near the town of Tutrakan (Tuturki) about 30 miles east north-eastward of Ruschuk, River Danube separates Bulgaria from Rumania.

*Chart 2214.*

- River Danube at Cernavodă (42° 22' N., 28° 02' E.), 171 miles from Sulina, is but 35 miles from Constanța on the Black sea; there is a railway between the two places which crosses River Danube at Cernavodă by a bridge 124 feet (37m8) above the water, with 15 spans, the central one of which has a width of 623 feet (189m9). The river bed is nearly 10 miles in breadth.

- Below Cernavodă River Danube bends northward for a distance of 90 miles to Galați (Galatz), which is situated 11 miles below Brăila, thence it flows in a general easterly direction to the sea.

*Chart 2835.*

- River Danube flows into the Black sea through Gura Sfântul Gheorghe and Gura Sulina, and through the numerous outlets of the delta of Kiliyskiy rukav (Delta of the Chilia or Kilia) known to the Rumanians as Brațu Chilia; and if the volume of water flowing out is, for the sake of comparison, supposed to be constituted of 100 parts, it is estimated that 24 of these issue from Sfântul Gheorghe, 9 from Sulina, and 67 from the branches of Kiliyskiy rukav. Tulcea, situated on the right bank proper of Brațul Sulina, is distant 39 miles from the entrance and Izmail (Ismail) on the left bank of Kiliyskiy rukav (Brațu Chilia), is 55 miles from Gura Sulina. From the same entrance, Isaccea, Reni, and Galați are 56, 70, and 81 miles, respectively.

- At the bifurcation of the river, about 4 miles north-westward of Tulcea, is Ceatal (45° 13' N., 28° 45' E.), a training wall stretching into the river in a north-westerly direction; this, by diverting a portion of the stream from Kiliyskiy rukav into Brațul Tulcea, increases the volume of water, and scours out Brațul Sulina.

**Pilotage.**—See page 200.

- Aspect of the delta.**—Beș tepe (Bestepe) range, from 700 to 800 feet (213m4 to 243m8) high, rises in the middle of the low-lying districts forming the delta, about 28 miles north-westward from Gura Sfântul Gheorghe; it is a prominent mark from seaward, having five peaks, but they are often entirely obscured by mist. Several lower peaks of the range lie westward of Beș tepe, in the direction of Tulcea, and extend beyond to Isaccea, bordering the southern shore of Brațul Sfântul Gheorghe.

The shores of the delta, covered with reeds but on which are very few trees, are only a little above the surface of the sea. They are marked only by fishermen's huts scattered along them.

*Charts 449, 2214.*

- Navigable depths.**—Above Brăila.—Between Brăila and the Iron Gates the general width of the river, when low, is about half a mile.

*Chart 449, 2214.*

Above Brăila ( $45^{\circ} 15' N.$ ,  $27^{\circ} 59' E.$ ) a depth of 18 feet (5m5) can be carried as far as Oltenitza (a few miles up River Mostiche), except during the months of October and November. Vessels drawing not more than 11 feet (3m4) can reach Giurgiu (Ghiurgevo), opposite Ruschuk; vessels of 17-foot (5m2) draught can reach a point  $3\frac{1}{2}$  miles below that town. A pilot for this part of the river can be obtained at Galați. 5

Owing to the existence of certain shoals with depths of from about 4 to 7 feet (1m2 to 2m1), which often shift their position, sea-going vessels rarely ascend higher than Brăila, but at ordinary high river, vessels of 12-foot (3m7) draught can navigate the river from Brăila to Turnu Severin without difficulty. 10

The extreme difference between high and low river level is  $24\frac{1}{2}$  feet (7m5) at Turnu Severin, 23 feet (7m0) at Nicopoli and Cernavodă, and at Brăila as given on page 207. 15  
*Chart 2835.*

*Below Brăila.*—From October 15th, 1933, to November 30th, 1934, the least depth in the river varied from 23 to 24 feet (7m0 to 7m3).

For depths in Gura Sulina, *see* page 199.

**Caution.**—In 1947, it was reported that the estuary of River Danube was silting and that the depths were less than charted. 20

**Alteration in depths.**—**Range of water level.**—River Danube is normally heavily charged with sediment, and in time of flood this condition becomes aggravated; and in consequence of this, the season at which the greatest depth may be expected is the time when shoals form with the greatest frequency and rapidity. It may happen that a vessel with the regulation draught may suddenly find it necessary, under pain of heavy penalties, to stop and lighten by discharging cargo. It must be borne in mind that these occurrences result not from the falling of the water, but, so to speak, from the rising of the bed of the river. 30

The depths in Gura Sulina are liable to constant change, and will generally be least outside the mole heads about June, July, and August. The depths between the moles will be least in the winter months before the descent of the spring floods, which generally commence in March.

The highest water in the river may be expected from February to July, and the lowest from August to December, depending altogether on the state of the weather during the year. The river and the Black sea are about zero at Gura Sulina during the winter months, but the level is sometimes raised 2 feet (0m6) by winter floods. Although the river level varies considerably at Tulcea, the floods appear to have very little effect on the level at Gura Sulina. 35 40

During the low water season the level of the river for several miles from its entrance is raised by easterly, and lowered by westerly winds, but when the river is in flood this influence of the wind is not observed, excepting near Sulina, where the Black sea affects the level. 45

A standard zero has been established to which soundings over any part of the river may be reduced, showing the actual depths which would exist over all the shoals if the river was at its lowest.

At Gura Sulina, during a river flood, with an easterly gale, the water has been banked up to a height of  $4\frac{1}{2}$  feet (1m3) above zero; with strong westerly winds, and at low river, the water is reduced to  $1\frac{1}{2}$  feet (0m5) below zero, thus giving the extreme range at  $5\frac{1}{2}$  feet (1m7), the mean range being 2 feet (0m6). 50

At Tulcea, the zero level of the river is only 1.01 feet (0m3) above the Black sea level, but during a heavy flood the river has been known to rise  $14\frac{1}{2}$  feet (4m5) above the Black sea level, the mean range being 9 feet (2m7). 55



**Chart 2835.**

At Brâila, the extreme difference between high and low river level is 19½ feet (6m0).

- Anchorage.**—Vessels are prohibited from anchoring other than in the prescribed anchorages of the Rumanian waters of River Danube except in cases of extreme urgency. The positions of permitted anchorages should be obtained from local authorities.

- Current.**—The rate of the current setting down the river varies according to the conditions, the maximum observed being 5½ knots at the mouth in abnormally heavy floods, and the minimum half a knot during very low water; the ordinary rate does not exceed 3 knots.

**Ice.**—See pages 27–28.

**Trade and shipping.**—The principal exports from River Danube ports are cereals and timber.

- 15 **Charts 2835, 2213.**

**International boundary.**—The main stream of River Danube forms part of the International boundary between Rumania and U.S.S.R. from a position near the entrance to River Prut (45° 26' N., 28° 14' E.), (page 206) to the Staro-Stambul'skoye girlo branch of the Danube delta.

- 20 **Danube Commission.**—See page 5.

**Chart 2835.**

**GURA SFÂNTUL GHEORGHE.**—**Dangers.**—**Navigational aids.**—

- The entrance to Gura Sfântul Gheorghe lies between the southern extremity of Ostrovu Sfântul Gheorghe and the easternmost of Insula Olinca, a group of islands lying close eastward of Ostrovu Dranova (page 193), about 1½ miles southward. The entrance can be identified from a distance of about 5 miles offshore by some prominent woods and hills northward of it. Gura Sfântul Gheorghe is only used by fishing craft with a draught not exceeding 5 feet (1m5).

- 30 A light is exhibited, at an elevation of 157 feet (47m8) from a white and black tower 164 feet (50m0) in height, situated about one mile north-westward of the northern entrance point of Gura Sfântul Gheorghe (44° 54' N., 29° 38' E.). A fog signal is sounded and a radiobeacon transmits from the light-structure.

- 35 Chotika beacon, a red metal truncated pyramid with a rectangular topmark painted in black and white bands, stands on the southern coast of Ostrovu Dranova, about 4 miles west-south-westward of Insula Olinca light-structure.

- The entrance is obstructed by an extensive sandbank with general depths of from one to 4 feet (0m3 to 1m2), which extends, with depths of less than 18 feet (5m5), about 2 miles eastward from the coast abreast the entrance, and as much as 2½ miles from the coast south-westward of it. Insula Sacalin, a long, narrow, sandy island, lies about half a mile within the edge of this sandbank, with its northern end about three-quarters of a mile southward of the northern entrance point of Gura Sfântul Gheorghe whence it extends roughly parallel with the coast of Ostrova Dranova for about 4½ miles south-south-westward.

- There are depths of from one to 4 feet (0m3 to 1m2) in the channel between Insula Sacalin and the coast of Ostrovu Dranova, but the principal channel passes northward of the island and close to the western side of the entrance.

A beacon, consisting of a mast surmounted by a barrel, stands on Insula Sacalin, about one mile south-south-eastward of its northern extremity.

- 55 Kyshla-vedaney beacon, a red circular metal tower with a rectangular

*Chart 2835.*

top-mark painted in black and white bands, stands on the eastern coast of Ostrovu Sfântul Gheorghe, about 9 miles north-north-eastward of Insula Olinca light-structure.

Within the entrance, the depths increase to from 19 to 33 feet (5m8 to 10m1) off the village of Sfântul Gheorghe, which is situated on the northern bank about one mile within the entrance. Above the village there are depths in the channel of from 11 to 66 feet (3m4 to 20m1). *Chart 2231.*

**Fishing areas.**—A fishing area extends for about 22 miles west-south-westward from the entrance of Gura Sfântul Gheorghe and up to 5 miles offshore. Another fishing area extends about 6 miles northward of the mouth of the same river and extends about 2½ miles offshore.

**Buoys.**—An isolated green spar buoy, which has no navigational significance is moored about 75 miles eastward of the entrance of Gura Sfântul Gheorghe.

A barrel buoy is moored about 53 miles east-south-eastward of the entrance of Gura Sfântul Gheorghe.

*Charts 2284, plan of Gura Sulina; 2213.*

**GURA SULINA.—Landmarks.**—Gura Sulina, the middle entrance to River Danube, which has been artificially regulated to pass between two moles, about one cable apart, extending from the coast at the mouth of the river, for a distance of about 4 miles in a general easterly direction, is about 17 miles northward of Gura Sfântul Gheorghe; it is the chief entrance used by vessels, on account of the greater depth maintained in it. Training walls are built within the inner ends of the moles, parallel with the course of the river.

The waterway, which has been shortened and straightened by various cuttings, extends 43 miles from the sea to Ceatal and is from 3 to 1½ cables wide; its banks in some places are 7 feet (2m1) high, and never less than 4 feet (1m2), and its minimum depth is given on pages 198 and below.

Sulina lighthouse stands in the town of Sulina, on the southern side of the entrance to Brațul Sulina. A church on the southern bank, about 1½ cables west-north-westward of the old lighthouse, and a water-tower, also on the south bank, about 1½ miles farther westward, are both conspicuous landmarks. An electric power station, about 2½ cables west-south-westward of the lighthouse, is also prominent.

**Light.**—Sulina light is exhibited at an elevation of 69 feet (21m0) from a white circular stone tower with a green cupola, 59 feet (18m0) in height, situated in the town of Sulina (45° 09' N., 29° 39' E.).

**Entrance channel.—Depths.—Depth signals.**—A least depth of 22 feet (6m7) is maintained as far as possible in this channel, but the depths are liable to change; silting may occur in the outer portion of the dredged channel during the spring and summer floods.

The depth in feet over the bar is displayed in figures at Sulina lighthouse; these figures can be read from the bar with the aid of binoculars.

**Navigational aids.**—A light is exhibited at an elevation of 47 feet (14m3), from a white square iron framework tower, 46 feet (14m0) in height, situated on the head of the southern mole. A fog signal is sounded from a position on the mole about 11 cables north-westward of this light-structure. A signal station is situated nearby.

A light is exhibited at an elevation of 39 feet (11m9) from a white framework tower with a black base, 39 feet (11m9) in height, situated on the head of the northern mole.

A pair of leading lights, 1½ cables apart, are exhibited from black tri-

*Charts 2284, plan of Gura Sulina; 2213.*

angular structures, each with a white central stripe, situated on the northern mole just under  $1\frac{1}{2}$  miles north-westward of the mole heads; in line, bearing  $301^{\circ}$ , they lead between the moles in the outer portion of the dredged channel.

O1 black conical light-buoy, exhibiting a *green flashing* light, is moored 11 cables south-eastward of the head of the southern mole.

O2 red conical light-buoy, exhibiting a *red flashing* light, is moored  $5\frac{1}{2}$  cables east-south-eastward of the head of the southern mole. This buoy is replaced during the winter by a black spar buoy surmounted by a ball.

A black beacon, situated about  $2\frac{1}{2}$  miles north-north-eastward of the leading-light structures, stands close within the edge of the shorebank south-eastward of Gura Stambul Vechiu, known to the Russians as Staro-Stambul'skoye girlo; a post, for surveying purposes, is situated on this bank, about  $2\frac{1}{2}$  miles westward of the beacon.

**Entrance signal.**—When the entrance is dangerous a blue flag is displayed at Sulina old lighthouse. This signal also indicates that a vessel is about to leave Sulina for the sea, and that no vessel is then to enter the approach channel from seaward.

**Pilotage.—Regulations.**—Pilotage is compulsory for merchant vessels, except in the case of vessels of less than 120 tons register, or 180 tons when crossing Sulina bar in ballast. Pilots meet vessels near O1 light-buoy, seaward of the entrance, in a tug with yellow upperworks, and are bound to board, when weather permits, or to signal how such vessels may enter. The pilot vessel flies the flag of the Danube Commission.

Pilotage into the Soviet-controlled ports of Kiliya (page 208), Izmail (page 208) and Reni (page 206) is also compulsory for vessels of the same tonnage as above.

Pilotage through Brațul Sulina from O1 light-buoy to Ceatal (*see above*) is undertaken by Rumanian pilots, and in the hours of daylight only. When not entering Soviet-controlled ports these pilots undertake the entire passage to Brăila.

Pilotage of vessels from Ceatal to the Soviet-controlled ports of Kiliya, Izmail and Reni, and also to the Black sea, is undertaken by Soviet pilots day and night.

Vessels approaching Soviet-controlled ports from sea should request the services of a pilot from the harbourmaster at Izmail, giving 7 hours notice in advance; vessels leaving these ports for sea should give 4 hours notice.

Although the employment of pilots is compulsory, should the state of the weather prevent the pilot boarding, a blue flag below a black ball will be displayed from Sulina Port mast; the captain may then enter the port on his own responsibility without a pilot.

Officers in command of vessels incur a serious responsibility by proceeding at a higher speed than that indicated by the pilot, or by inducing him to adopt a higher speed than his experience would warrant.

The pilots place at the disposal of the captain their experience and knowledge of the river; but as they cannot know the manoeuvring qualities of each ship, the responsibility for the vessel's movements lies entirely with the captain. The Danube Commission admits no responsibility for damages incurred by the ship itself, nor for other damages of any kind.

The river pilots, who take charge off Sulina, form an entirely distinct service from the sea pilots.

There are pilot officers at Sulina, Galați, and Brăila.

The vessel's national flag must be displayed before entering, and should explosives form any portion of the cargo, a declaration to that

*Charts 2284, plan of Gura Sulina ; 2213.*

effect must be made to the pilot, and a red flag displayed at the fore; special anchorage is allocated under these circumstances.

**Anchorage.**—Vessels waiting to enter the river anchor either northward of the entrance light-buoys in depths of from 42 to 48 feet (12m8 to 14m6) sand, or, occasionally, between the buoys in depths of from 30 to 36 feet (9m1 to 11m0). 5

**Current.**—The current in the offing sets south-south-eastward at a rate of from one quarter to half a knot. The surface water, to a depth of about 3 feet (0m9), is influenced by the wind. The inshore or eddy current is variable, both as regards rate and direction. 10

**Directions.**—The coast in the vicinity of Gura Sulina is low and sandy but the entrance can be distinguished from the entrances southward by its being quite devoid of trees. On approaching from eastward, the five peaks of Beş tepe range, described on page 196, will be sighted if the weather is clear; in thick weather the discoloured water serves as an excellent indication of the approach to the entrance. 15

Vessels approaching the entrance from southward should sound continuously, and should not approach within depths of 60 feet (18m3) until certain of the position. 20

In the northern approach the soundings give little guidance and cannot be relied upon. The shallow bank fronting Gura Stambul Veciu is rapidly extending southward and south-eastward and encroaching on Gura Sulina. *See also* caution above.

Vessels without local knowledge should make Ostrov Zmeinyy (45° 15' N., 30° 13' E.), described on page 211. From a position off the western side of this island course should be shaped direct for O1 light-buoy off the entrance. If the weather is clear Beş tepe range should be sighted right ahead, and, on a nearer approach, Sulina water tower, 134 feet (40m8) high, situated a short distance westward of the town, and then the lighthouses and the buildings on either side of the entrance will become visible. When near O1 light-buoy, vessels should heave to or anchor, and await the arrival of a pilot. 25 30

The depths in the approach to the entrance are constantly changing and, in consequence, no reliance should be placed on the soundings charted near the entrance. Vessels should not proceed westward of O1 light-buoy without a pilot. 35

*Chart 2284, plan of Gura Sulina.*

**Port of Sulina.**—The port of Sulina comprises Braţul Sulina for a distance of 3 miles up-stream, commencing from the zero point on the milepost scale, and that part of Braţul Sulina forming the outer port between that point and the mole heads at the mouth. The Sulina roadstead comprises the sea area within a radius of 2 miles from the head of the northern mole. 40

Sulina is a "free" port, the free zone extending for a distance of 3 miles round Sulina, seaborne goods entering the port not being subject to customs duties, with the exception of the Rumanian Government monopolies of tobacco, spirits, beer, salt, gunpowder, matches, and playing cards. 45

It is the port of transhipment for the large bulk of grain brought down River Danube. 50

Quays extend along both sides of the river for the whole length of the port; the depth alongside, in 1965, was 24 feet (7m3).

The port is divided into four sections, which are numbered from seaward. The limits of the sections are marked by posts of various colours on both banks of the river. The first section is reserved for men-of- 55

*Chart 2284, with plan of Gura Sulina.*

war, and vessels belonging to the Danube Commission; it is also used by power-driven vessels plying regularly to River Danube. The second section is for tugs, for laden vessels awaiting favourable weather to go to sea, and for sailing lighters. The third section is for vessels bound up-  
 5 river, and for empty barges and lighters. The fourth section is for vessels loading cargo, and is divided into 50 berths, 25 on each side of the river.

The lower part of the port, on the left bank, below all other vessels, is reserved for vessels carrying petroleum.

10 Vessels carrying explosives must anchor in the upper part of the port above all other vessels.

Ships must be anchored in the berths allotted by the Port officials, who will give all necessary directions regarding the placing of hawsers.

15 Anchors must always be ready for letting go, and a kedge for laying out in case of necessity.

A gangway and a quarter pole must be taken on board. They can be obtained from the works of the Danube Commission on the northern bank of the river. The spike of the quarter pole is placed in the bank or lashed to a bollard on the quay, and the other end of the pole against the vessel's  
 20 quarter to keep her stern off the bank, whilst the bow is kept off by an anchor, the ship being breasted in with springs.

**Administration.**—While the policing of the river is under the jurisdiction of the Danube Commission, possessing Sovereign rights, the territorial authority, Rumania, controls the town police and the Custom  
 25 House.

**Quarantine.**—The detached mole on the northern side of the entrance to the port is reserved for vessels in quarantine. The Health officer boards vessels in the port.

**Port regulations.**—Copies of the Port Regulations are obtainable at the  
 30 Port Administration offices which are situated on the south bank close northward of Sulina lighthouse. The roadstead and the port are under the authority of the Captain of the Port; from thence an Inspector of Navigation has charge of the navigation of the river as far as Biâila. Officers in charge of vessels are required to communicate with the Captain of the  
 35 Port within twenty-four hours of their arrival, and to obey all orders received from him, the Inspector of Navigation, or their subordinates.

All vessels entering Gura Sulina must have at least one foot (0m3) less draught than the depth indicated as existing on the bar at the time. Power-driven vessels of more than 1,000 tons gross register are to be provided with  
 40 an auxiliary rudder, unless the Captain of the Port is satisfied that they are capable of navigating the river without it.

Power-driven vessels which come down the river, and exceed 130 feet (39m6) in length, are not allowed to turn in any part of Sulina port occupied by other vessels; and power-driven vessels, more than two abreast,  
 45 may not move in the port when lashed together. Vessels at the mooring places should not allow yards, derricks, or booms to protrude beyond a minimum from the ship's side. It is reported that a portion of the south bank close to Sulina lighthouse has been cut away to assist large vessels in turning.

50 No boats are permitted to move in the port, or from the port to the roadstead at night, unless they show a light.

No ballast, ashes, etc., are to be thrown overboard, but they are to be placed in places appointed for that purpose.

For regulations *re* use of whistles and sirens, *see* page 204.

55 **Sulina.**—**Port facilities.**—The town of Sulina (45° 09' N., 29° 39' E.) is situated on the southern bank of the river and includes the principal

*Chart 2284, plan of Gura Sulina.*

buildings of the Danube Commission, the workshops and the houses of the employees of the Commission being on the northern bank. The population, in 1946, was about 5,000. The town has no industrial or commercial importance apart from shipping.

The language for intercourse in Government Departments is Rumanian, but at the Danube Commission French is used.

Seamen are treated at the Danube Commission hospital; there is a hospital for epidemic diseases.

There is a British Seamen's Institute in Sulina.

A limited quantity of coal might be available in emergency.

Small quantities of fuel oil can be supplied from tank vessels.

Fresh provisions are not plentiful at all seasons. Drinking and boiler water is laid on to the quays.

Repairs can be carried out. There is a floating crane with a capacity of 10 tons. Two medium and two small tugs are available. There are several lighters in the port.

Ice.—See pages 27–28.

**Trade and shipping.—Communications.**—Trade is entirely confined to the shipment of grain, timber and oilcake.

There is regular sea communication with other European ports and with those farther up the river.

*Chart 2835.*

**SULINA TO BRĂILA.—Buoys and leading marks.**—In difficult parts of the river the channel is marked by red conical and black can buoys; during winter they are replaced by spar bouys.

Red buoys indicate that the channel lies between them and the right bank, and they must therefore be left on the starboard hand by vessels proceeding up-river; and black buoys, that the channel lies between them and the left bank. The channels are also marked by leading beacons, consisting of posts, each surmounted by a diamond, painted black with a white vertical stripe, erected on the banks of the river.

The posts marked with inverted anchors indicate places where vessels are forbidden to anchor.

The whole of Brațul Sulina from its entrance up to Brăila is divided into miles, and each is marked by a post, situated on the left bank, with the number of miles from Sulina marked on it.

As a general rule, when the banks of the river appear steep the channel is deep, where the trees and reeds grow to the water's edge it is shallow.

**Pilotage.**—See page 200.

**Lights.—Signals.**—The first  $8\frac{1}{2}$  miles of Brațul Sulina is lighted on both banks.

A light ( $45^{\circ} 11' N.$ ,  $28^{\circ} 55' E.$ ) is exhibited, at an elevation of 20 feet (6m), from a black post on Ceatal Sfântului Gheorghe and marks the junction of Brațul Sulina and Brațul Sfântul Gheorghe, about 34 miles above Sulina.

A light is exhibited, at an elevation of about 20 feet (6m), from an iron framework structure, painted white, situated on the extremity of a line of rocks extending from the southern shore of the river, about half a mile below Tulcea.

A light is exhibited, at an elevation of about 20 feet (6m), from a white post on Ceatal, and marks the junction of Brațul Tulcea and Brațul Chilia, known to the Russians as Kiliyskiy rukav, about 43 miles above Sulina.

A blue flag displayed by day on the flagstaffs of the Inspectorates at Ceamurlia, about  $9\frac{1}{2}$  miles above Sulina, Gorgova, about 21 miles above

*Chart 2835.*

Sulina, Ceatal Sfântului Gheorghe, and Tulcea, indicates the closing of Brațul Sulina. At night three lights, disposed vertically, are substituted. A red triangular flag displayed on the flagstaff of the Inspectorate at  
 5 Tulcea indicates that the current at the Tulcea bend is very strong, and it is necessary to round the bend with great care.

A blue flag displayed on the mast of a dredger indicates that the passage is closed as long as the signal is displayed.

A blue flag displayed at the yardarm of a flagstaff on the quay at Reni  
 10 is a signal for vessels to pass as slowly as possible.

**Caution.**—When proceeding up river and rounding Tulcea bend, an anchor should be ready for letting go, as in endeavouring to avoid the rock, marked by a light-structure off the right bank, vessels hug the other shore where the water is slack, but at the bend when they wish to  
 15 turn up, the full force of the current catches the bow, swinging it off to port.

**Depth signals.**—The depths on the shoals in Brațul Sulina are posted in a conspicuous place on the southern bank of the river at Sulina, also near the 21st mile post, and are shown in English feet. At Tulcea they are  
 20 posted on one of the Danube Commission storehouses above the port.

When sudden changes occur in the least depths in Brațul Sulina, the amount is indicated by black balls displayed on the flagstaffs of the Inspectorates at Ceamurlia, Gorgova, Ceatal Sfântului Gheorghe, and Tulcea, each ball shown representing a decrease in depth of 3 inches (0m1).

**Regulations.**—The rule of the road, and regulations regarding lights, are the same as those in general use at present with the following additions:—Vessels proceeding in the same direction should not, as a rule, endeavour to pass one another; and those passing in opposite directions should only do so in places where the width of the channel is sufficient.  
 25  
 30 Vessels proceeding up river should wait below all narrow places and bends to allow those descending to pass; and the use of sound signals indicating direction of helm or reversal of engines is advisable, and the sound signal of the descending vessel is the ruling one.

When one power-driven vessel wishes to pass another going in the same  
 35 direction, she should give five short blasts on the siren or whistle, when the other vessel, if she can safely do so, should reduce speed and haul over to the left side of the channel, and at the same time give two short blasts on the siren or whistle, on the receipt of which, and not before, the first-mentioned vessel can pass her. One long blast warns vessels lying alongside  
 40 to tend their hawsers; three long blasts signifies that a vessel is turning round.

A power-driven vessel wishing to pass a sailing vessel should make the signal prescribed above, and pass to leeward of her. Speed should be slackened when passing grain-laden lighters or dredgers, and in all cases where  
 45 the wash is likely to be injurious, also when approaching bends, until it is assured that the river is clear ahead; and power-driven should never attempt to pass unnecessarily close to any vessel, especially one dropping down with the stream.

Sailing vessels tacking must avoid getting in the way of power-driven  
 50 vessels. Sailing vessels with the wind free must keep out of the way of vessels close hauled, or vessels drifting. Tugs and light-draught power-driven vessels proceeding up the river may navigate at night.

Vessels anchored or moored in the river for the night are required to have a light placed on the yardarm, or other conspicuous part, on the  
 55 side toward the channel, which can be seen both up and down the river; if more than 150 feet (45m7) long they must, in addition, exhibit a *white*

**Chart 2835.**

light at or near the stern of the vessel. Rafts navigating at night should exhibit a *white* light at each angle, and three *white* lights disposed vertically at the masthead; when secured to the bank, the lights will only be exhibited from the angles towards the channel.

The customary sound signals must be used in thick weather by vessels under way, also sound signals by whistle or siren to indicate the course to other vessels under way; but ships anchored in the port of Sulina, or moored at the quays alongside the banks, are forbidden to use either whistles or sirens under any circumstances; and the use of the whistle or siren is strictly prohibited between the light-and-whistle buoy off Gura Sulina and the third mile post. See also page 202.

**Speed limits.**—Vessels of more than 1,000 tons register must not exceed a speed of 8 knots through the water when navigating Brațul Sulina. When, however, the river is high, permission may be obtained from the Inspector of Navigation for vessels bound down the river to proceed at 9 knots.

Vessels, under 1,000 tons, which the Danube Commissioners consider might cause damage to the river, if they exceeded 8 knots, may also receive instructions to proceed at this modified speed.

When the river is low it is recommended that all vessels should reduce speed to 5 knots, especially in the upper portion of Brațul Sulina and in the cuttings.

Power-driven vessels must reduce speed, as far as possible, when passing through the ports of Sulina ( $45^{\circ} 09' N.$ ,  $29^{\circ} 39' E.$ ), Tulcea, Reni (see also Signals, page 203–204), Galati and Braila.

**Tracking.**—There is a towing path with mooring ports, on the southern bank of Brațul Sulina below Ceatal Sfântului Gheorghe, having a least breadth of 20 feet (6m1).

**Anchoring and mooring.**—Anchors must always be ready for letting go, and a kedge for laying out in case of necessity.

Posts are provided on both banks of the river to which vessels may secure; but if hawsers are laid out across the river, they must be promptly slackened should another vessel require to pass, and on no account are they to be left across the river during the night or in foggy weather.

Anchoring or mooring alongside the banks is forbidden in the bends of the river, in any portion situated between the posts having an anchor reversed painted on them, or in the navigable channel; vessels must never be moored more than three abreast along either bank, and while at anchor yards, booms and derricks should not protrude into the fairway.

In the event of grounding in the river a look-out man must be sent to some suitable place, at least half a mile above the place where the vessel has taken the ground. The river authority must be informed of the circumstances by the most rapid means and other traffic in the river warned.

Posts, each surmounted by a red rectangular cross, indicate places where large vessels descending with the current can most easily, in case of need, swing to their anchor.

**Vessels proceeding to sea.**—Vessels which have loaded at one of the ports in the Lower Danube, and do not require to visit the port of Sulina ( $45^{\circ} 09' N.$ ,  $29^{\circ} 39' E.$ ), may proceed direct to Sulina roadstead.

Masters of vessels desiring to avail themselves of this privilege are recommended to communicate the fact by telegram to the Captain of the port at Sulina on their departure from the port of loading, and mention in the telegram, as nearly as possible, the probable time of arrival at Sulina. Before reaching Ceatal Sfântului Gheorghe, the vessel must display



*Chart 2835.*

the Blue Peter at the foremast head, in order that the look-out at this station may notify the passing of the vessel to the Captain of the port. This flag must be kept flying during the entire passage of Brațul Sulina.

- 5 On the arrival of the vessel in the port of Sulina, an agent of the Port police will proceed on board with a pilot for the passage over the bar, and, on receiving the ship's list from the master, will give the pilot permission to take the vessel direct to the roadstead.

- 10 As soon as the vessel has anchored, the master will return to the port in order to pay the navigation dues, present the bills of lading, and carry out other formalities required by the regulations.

If the vessel cannot proceed direct to sea owing to the depth on the bar, bad weather, or other circumstances, the master will be duly advised of this and must anchor within the bar.

- 15 It is specially important that masters wishing to proceed direct to Sulina roadstead should arrange to leave the port of loading so as to arrive at Sulina at an hour when the offices of the Danube Commission, the Quarantine offices, and the Consulates are open.

**LOWER DANUBE PORTS.**—Sulina is described on pages 202–203.

- 20 **Pilotage.**—See page 200.

**Tulcea.**—Tulcea ( $45^{\circ} 10' N.$ ,  $28^{\circ} 49' E.$ ) is situated on high ground on the southern bank of River Danube, between the 38th and 39th mile posts. A Prefect and the Inspector of the Danube Commission reside here.

- 25 In 1927, there was a depth of at least 24 feet (7m3) in the berths alongside the bank.

The buoys are not to be used for mooring, except by regular steamers, stopping for a short period; vessels may, however, use them for warping round the Tulcea curve, but only one vessel at a time is allowed to haul on the same buoy.

- 30 **Isaccea.**—Isaccea, in Rumanian territory, lies on the southern bank, about 17 miles above Tulcea, and 56 miles from Sulina.

A pontoon landing pier, at which the river vessels berth, is situated about one mile below the town.

- 35 **Reni.**—Reni is situated in U.S.S.R. territory (see page 198) on the northern bank, 70 miles above Sulina. River Danube, within the boundaries of the port, for a distance of 40 yards (36m6) from its bank, has a regular depth of from 40 to 50 feet (12m2 to 15m2). The port can be used by vessels drawing  $19\frac{1}{2}$  feet (6m0). There are wharves at the port divided into 10 separate berths. The anchorage is a quiet one. The velocity of the stream is from  $1\frac{1}{2}$  knots to 3 knots. The fluctuation of the river level varies from 15 to 20 feet (4m6 to 6m1).

- 40 River Prut (Prutal), which flows into River Danube about 2 miles above Reni, has a total length of about 500 miles, and is navigable for about 200 miles. (See page 198). During the dry season the depth in places is not more than 2 feet (6m0), but in the spring the river rises from 10 to 12 feet (3m0 to 3m7). Only specially built flat-bottomed barges can ply on the river.

- 50 **Galați**—Galați ( $45^{\circ} 25' N.$ ,  $28^{\circ} 05' E.$ ), situated on the northern bank of the river, and between the 79th and 83rd mile posts above Sulina, is a well laid out town with a population, in 1966, of 151,349; it is the chief port of entry into Rumania. The river side is bordered by a quay.

During the summer there is a great deal of marsh fever here, as indeed in all parts of the Lower Danube, to which newcomers are especially liable.

- 55 Vessels are berthed at Galați by a harbour pilot, who takes over charge

**Chart 2835.**

from the river pilot. When leaving, the river pilot takes charge from the berth.

Part of the quay is reserved for men-of-war, and part for merchant vessels; it is necessary to let go an anchor before making fast alongside. 5  
At night vessels must exhibit a light at each end.

At normal level the depth alongside the quays in the river is 36 feet (11m0) and 27 feet (8m2) when the river is low.

Zeglina harbour, for warships, lies a little above Galați.

**Chart 2835, plan of Galați dock.**

10

A basin with the following dimensions is situated near the lower end of the town:—Length, 1,640 feet (499m9); width, 395 feet (120m4); breadth of entrance, 131 feet (39m9). In 1967, there were depths of 24 feet (7m3) in the entrance, and in the basin. There are several electric cranes at the basin, the largest of which has a lifting power of 40 tons. 15  
**Chart 2835.**

There is a timber basin at the 79th mile post at the eastern end of Galați, where there are five berths available for vessels. Vessels of 440 feet (134m1) in length and drawing up to 21 feet (6m4) can berth on the southern side of the basin. There is a depth of 27 feet (8m2) alongside the western 20 side of the basin, and depths of 13 to 16½ feet (4m0 to 5m0) on the northern and eastern sides. Vessels secure alongside pontoons, which are constructed as loading ramps. Hawasers are secured to the pontoons and ashore; fenders should be used. Vessels waiting to berth alongside should anchor in the river with two anchors down. Drinking water is available at the 25 timber basin.

A number of tugs are available.

Any repairs can be carried out. There is a slipway capable of accommodating small craft.

There is a floating dock; for details *see* Appendix I.

30

Fresh provisions are plentiful. Drinking and boiler water is supplied by means of hydrants on the quay; application should be made to the municipal authorities.

The Jewish hospital is the one used by the British community.

There is a regular air service to Constanța, and Bucharest.

35

**Brâila.**—The town of Brâila (45° 15' N., 27° 59' E.), on the northern bank of the river, is situated between the 91st and 93rd mile posts, immediately above the junction with the Machin branch. It is the usual limit of navigation for sea-going vessels and is the principal port in Rumania for the export of grain. The town contained a population of 40 138,587 in 1966.

A granite quay has been constructed, alongside, which there are a number of loading berths with two pontoons attached to each, connected with the quay by portable iron spans. In 1966, there were depths of at least 24 feet (7m3) in the berths. Vessels are obliged to employ a pilot when 45 berthing or shifting berth, when entering or leaving the dock, and when entering or leaving the port.

**Chart 2835, plan of Brâila dock.**

A basin with the following dimensions is situated close to the 91st mile post:—Length, 1,640 feet (499m9); width, 395 feet (120m4); breadth 50 of entrance, 131 feet (39m9); in 1922 the depth at low river level, owing to silting and subsequent dredging, varied from about 12 to 21 feet (3m7 to 6m4). The quays are connected with the general railway system.

In the basin there are several cranes of from 2½ to 7 tons capacity. A 40-ton crane and a 15-ton floating crane are also available. Several 55 lighters are available.

Vessels are allowed to winter in the basin.

**Chart 2835.**

**Port facilities.**—A small tug is used for assisting vessels to turn round in the dock.

There is a small floating dock, for details *see* Appendix I.

- 5 A small quantity of coal is stocked and can be supplied in baskets at a rate of from 25 to 30 tons per hour. Sea-going vessels very seldom coal at Brăila.

Fuel oil is obtainable and can be taken in at a river berth at a rate of from 60 to 70 tons an hour.

- 10 Fresh provisions are plentiful. Drinking and boiler water can be supplied to vessels alongside the grain-loading quay.

There is a bed for British seamen in the Rumanian hospital.

**Climatic table.**—*See* page 75.

- 15 **Izmail.**—Izmail (Ismail) ( $45^{\circ} 20' N.$ ,  $28^{\circ} 51' E.$ ), a town of about 86,000 inhabitants in 1940, in U.S.S.R. territory, is situated about 11 miles below Ceatal, on the left bank of Kiliyskiy rukav (Brațu Chilia or Kilia), but is accessible by way of Gura Sulina.

- It is a large sea and river port and is suitable for large vessels: there are depths of between 33 and 59 feet (10m0 and 18m0) in the vicinity of the port, and depths of  $16\frac{1}{2}$  to 49 feet (5m0 to 15m0) in the anchorage, where the holding ground is soft mud.

There is a wharf with berths for seven vessels, as well as a landing stage for passengers.

There are electric and floating cranes available.

- 25 Provisions and fresh water are obtainable.

Fuel oil and coal can be supplied.

Minor repairs can be carried out.

- 30 **Kiliya.**—Kiliya (Chilia) ( $45^{\circ} 26' N.$ ,  $29^{\circ} 16' E.$ ) situated on Kiliyskiy rukav (Brațu Chilia) about 23 miles below Izmail, in U.S.S.R., is only accessible by way of Sulina and Izmail, except by vessels drawing 13 feet (4m0) or less, which can enter by Ochakovskoye girlo (Gura Oceacov).

The approach to Kiliya is impeded by a sandbank which has a depth of about 17 feet (5m2).

- 35 The depth alongside the quays was reported to be, in 1967, from 18 to 21 feet (5m5 to 6m4).

Tugs are available.

There is a floating crane.

Minor repairs can be executed.

**DELTA OF KILIYSKIY RUKAV.—International boundary.**—

- 40 **Dangers.—Caution.**—The mouths of Kiliyskiy rukav (Delta of the Chilia) of River Danube cover a distance of about 20 miles. The largest of these mouths are Staro-Stambul'skoye giro, also known to the Rumanians as Gura Stambul Vechiv and situated about 5 miles northward of Sulina, Girlo Bistroye, Girlo Ankudinov, Ochakovskoye girlo, and Girlo Prorva.

- 45 **Charts 2213, 2835.**

As already stated on page 198, Staro-Stambul'skoye forms part of the international boundary between Rumania and the U.S.S.R.

- 50 The whole delta is fronted by a flat which, in 1967, extended about  $1\frac{1}{2}$  miles offshore, rendering these mouths useless for navigation by other than local fishing craft.

The coastline, depths, and channels are constantly changing and caution must be used in approaching the delta as the land is only just visible from many places on the outer edge of the flat.

The pine forest of Letea (Chart 2835) north-westward of Sfăștovca church

*Charts 2213, 2835.*

(45° 18' N., 29° 36' E.), which lies about 5½ miles north-westward of Staro-Stambul'skoye girlo, forms a good landmark.

**Caution.**—Attention is drawn to an area off the coast between Staro-Stambul'skoye and Girlo Bistroye, which is dangerous on account of 5 mines; *see* NEMEDRI.

**Navigational aids.**—A fishing light is exhibited from a white mast, 16 feet (4m9) in height, situated on the eastern point of Staro-Stambul'skoye girlo.

No. 1 conical light-buoy, painted in red and white bands, fitted with 10 a radar reflector and exhibiting a *red flashing* light, marks the outer side of the approach to Girlo Bistroye and is moored about 4½ miles south-south-eastward of the entrance to the river (45° 20' N., 29° 46' E.).

A fishing light is exhibited at an elevation of 14 feet (4m3) from a white wooden post, 13 feet (4m0) in height, situated about three-quarters of a 15 mile within the entrance of Girlo Bistroye, on the northern side of the river.

The river above the entrance to Girlo Bistroye is marked on either side by *white flashing* lights.

The entrance to Girlo Ankudinov is situated 4½ miles northward of 20 Girlo Bistroye entrance light-structure.

A light is exhibited at an elevation of 16 feet (4m9) from a white mast, 16 feet (4m9) in height, situated on the northern side of the entrance to Ochakovskoye girlo, 2½ miles northward of Girlo Ankudinov entrance.

A red and white spar buoy surmounted by a topmark and a radar reflector is moored about 3½ miles east-south-eastward Girlo Ankudinov 25 light.

**Fishing area.—Caution.**—A fishing area extends from the coast in the approach to Ochakovskoye girlo to a distance of about 3 miles north-eastward and southward of the entrance; vessels navigating in this area must exercise caution because of the existence of nets and other fishing gear. 30

**Coast.—Navigational aids.—Anchorage.**—Bukhta Zhebriyanskaya is entered between the northern end of the delta of Kiliyskiy rukav and the coast northward. There is a prominent church in the town of Primorskoye (45° 31' N., 29° 36' E.) which is situated about three-quarters of a mile 35 within the North western shore of the bay.

A rock with a depth of 33 feet (10m1) over it, lies about 10 miles eastward of Primorskoye church; for other dangers, *see* page 212.

A light is exhibited from a black tower situated on the western side of the entrance channel about 9¾ cables north-eastward of Prorvinsky light-structure, *see* below. 40

Prorvinsky light is exhibited at an elevation of 59 feet (18m0) from a red square metal framework tower, 55 feet (16m8) in height, situated on the eastern side of the approach channel to Girlo Prorva, on the eastern side of the entrance to Bukhta Zhebriyanskaya, about 6½ miles east-south-eastward of Primorskoye church (45° 31' N., 29° 37' E.). 45

A light is exhibited from a red tower situated on the western side of the above approach channel, about 3¼ cables south-westward of Prorvinsky light-structure.

A light-and-whistle buoy, fitted with a radar reflector is moored about 2½ miles north-eastward of Prorvinsky light-structure. 50

A light buoy, painted red and white in bands, exhibiting a *red flashing* light *every three seconds*, is moored about 4 miles eastward of the same light-structure.

Leading lights for the entrance to Girlo Prorva are situated about 1½ miles south-westward of Prorvinsky light-structure. The front light is 55 exhibited at an elevation of 32 feet (9m8) from a white rectangular beacon

*Charts 2213, 2835.*

with a black stripe and disc, 39 feet (11<sub>m</sub>9) in height; the rear light is exhibited at an elevation of 56 feet (17<sub>m</sub>1) from a similar structure, 59 feet (18<sub>m</sub>0) in height; in line, these lights bear 219½°. Lights are also  
5 exhibited from structures on the western bank of the river, farther southward.

In 1964, the least depth in the approach channel of Girlo Prorva was 12 feet (3<sub>m</sub>7); the channel was then marked by white posts, with white shields on which were painted black numbers.

- 10 The town of Vilkov (Válcov or Valkov), in which there is a conspicuous church is situated about 4½ miles southward of the head of Zaliv Solenyy Kut, the inner part of Bukhta Zhebriyanskaya, at the junction of Ochakovskoye girlo with the main Kiliyskiy rukav. Vilkov is the centre of the fishing industry of the delta.

- 15 Anchorage in depths of 24 to 42 feet (7<sub>m</sub>3 to 12<sub>m</sub>8), may be obtained in Bukhta Zhebriyanskaya, but as stated above, caution is necessary when approaching the delta.

**Bukhta Zhebriyanskaya.**—Bukhta Zhebriyanskaya is described on page 211.

## CHAPTER VI

OSTROV ZMEINYIY.—NORTH-WESTERN SHORE OF BLACK SEA:  
BUKHTA ZHEBRIYANSKAYA TO DNEPROVSKIY LIMAN

*Charts 2231, plan of Fidonisi; 2213.*

**OSTROV ZMEINYIY.—Dangers.**—Ostrov Zmeinyy (Insula Serpilor or Fidonisi) ( $45^{\circ} 15' N.$ ,  $30^{\circ} 12' E.$ ), situated about 21 miles east-north-eastward of Gura Sulina (page 199) is Russian territory. It is about 130 feet (39m6) high, and its coast is a continuous cliff, from 50 to 70 feet (15m2 to 21m3) in height. There are several landing places, but the two best are those at the north-eastern and southern sides of the island, depending on the prevailing wind. Depths of from 18 to 30 feet (5m5 to 9m1) extend about one-third of a cable from the western and southern sides, and within these limits the bottom is foul. A spit with a least depth of 59 feet (18m0) extends one mile north-eastward from the island. *See view No. [9].*

**Navigational aids—Signal station**—A light is exhibited, at an elevation of 180 feet (54m9) from a white tower 71 feet (21m6) in height on the highest point of Ostrov Zmeinyy. A fog signal is sounded; and a radiobeacon transmits from a position near the lighthouse.

There is a signal station to which vessels should report the ship's name, nationality and ports of departure and destination.

**Anchorage.**—Anchorage can be obtained anywhere under the lee of the island, or, with good shelter from winds between north-west and north-east, in a depth of 11 fathoms (20m1), sand and shells, about 3 cables southward of the lighthouse.

*Chart 2213.*

**BUKHTA ZHEBRIYANSKAYA TO DNESTROVSKO-TSAREGRADSKOYE GIRLO.—Coast.—Aspect.**—From abreast the village of Primorskoye ( $45^{\circ} 31' N.$ ,  $29^{\circ} 36' E.$ ) to Dnestrovsko-Tsaregradskoye girlo about 50 miles north-eastward, the coast is formed by the edge of a low-lying plain which in places is only just above sea level but on which there are occasional hillocks.

A chain of shallow salt lakes, separated from the sea by narrow necks of sand, extends from Primorskoye to Mys Burnas, about 29 miles north-eastward. Liman Sasyk, the south-western of the salt lakes is connected to the sea by a narrow channel which at times has a depth of 4 feet (1m2), but is usually closed by sand. The lakes north-eastward of Liman Sasyk are known as Ozero Dzhartsheyskoye, Ozero Malyy Sasyk, Ozero Shagany, Ozero Alibey, Ozero Kurugel and Ozero Burnas.

Mys Burnas ( $45^{\circ} 49' N.$ ,  $30^{\circ} 09' E.$ ), on which there is a guardhouse, is a prominent rise on the sand ridge at the south-eastern corner of the lake of the same name.

The coast between Mys Burnas and Kurortnoye guardhouse, about 10 miles north-eastward, is noticeably higher than the coast south-westward and north-eastward. On this stretch are two sawmills and also a village, which lies in a valley near a mill; fishermen's huts can be

*Chart 2213.*

seen at various points along it. The village of Primorskoye ( $45^{\circ} 57' N.$ ,  $30^{\circ} 17' E.$ ), not to be confused with the village of the same name referred to above is situated about 2 miles northward of Kurortnoye. A chimney  
 5 stands near the coast about  $5\frac{1}{2}$  miles north-eastward of Primorskoye, and  $4\frac{1}{2}$  miles south-westward of Dnestrovsko-Tsaregradskoye girlo.

**Coastal bank.—Lights.—Obstruction.**—The coastal bank with depths of less than 30 feet (9m1) extends from about half a mile to  $2\frac{1}{2}$  miles off this stretch of coast; depths of 60 feet (18m3) extend up to  
 10 20 miles from the coast. See also page 209.

Shagany light ( $45^{\circ} 40' N.$ ,  $29^{\circ} 53' E.$ ) is exhibited, at an elevation of 39 feet (11m9), from a structure 34 feet (10m4) in height situated near the southern end of Ozero Shagany.

A rocky patch with a depth of 10 feet (3m0) over it, situated about  
 15 5 miles south-south-westward of Shagany light-structure, is marked on its south-eastern side by a light-buoy, painted red and white in stripes, fitted with a radar reflector, and exhibiting a *red flashing light every two-and-a-half seconds*. This patch lies at the southern end of a rocky spit which, with depths of less than 30 feet (9m1) over it, extends south-  
 20 ward for about 3 miles from the coast.

An obstruction, over which there is a depth of 33 feet (10m1), lies about 4 miles south-south-westward of Mys Burnas.

Burnas light is exhibited, at an elevation of 77 feet (23m5), from a framework structure carrying a white daymark with a black central stripe, 56  
 25 feet (17m1) in height, close to Mys Burnas.

Budaki light is exhibited, at an elevation of 125 feet (38m2), from a red square metal structure carrying a black daymark with a white central stripe 50 feet (15m2) in height, about  $8\frac{1}{2}$  miles north-eastward of the Mys Burnas light-structure.

30 *Charts 2213, 2212.*

**Off-lying banks and dangers.—Obstructions.—Buoyage.**—Banka Dnestrovskaya, which is about 3 miles wide, extends about 7 miles northward from a position about 10 miles east-south-eastward of Dnestrovsko-Tsaregradskoye girlo ( $46^{\circ} 04' N.$ ,  $30^{\circ} 28' E.$ ). A least depth of 11 feet  
 35 (3m4) was reported on the bank, in 1963. There are three obstructions on the bank, each with a depth of 16 feet (4m9) over it. The northern and southern ends of this bank are each marked by a spar buoy, fitted with a radar reflector; the southern buoy, moored about 2 miles southward of the shallowest part of the bank, is painted red and surmounted by an  
 40 upturned broom topmark; the northern buoy, is painted white and surmounted by a down-turned broom topmark.

An obstruction with a depth of 40 feet (12m2) over it lies northward of the above bank, about  $8\frac{1}{2}$  miles north-eastward of the entrance to Dnestrovsko-Tsaregradskoye girlo.

45 An obstruction, with a depth of 23 feet (7m0) over it, lies 11 miles southward, and another obstruction lies nearly  $5\frac{1}{2}$  miles south-eastward, of the southern point of Dnestrovsko-Tsaregradskoye girlo.

In 1935, an obstruction over which there is a depth of 25 feet (7m6) was reported in a position  $14\frac{1}{2}$  miles eastward of Dnestrovsko-Tsaregradskoye girlo. A conical light-buoy painted red and white in stripes, and fitted with a radar reflector, and exhibiting a *red flashing light every two-and-a-half seconds*, is moored close eastward of this obstruction.

A bank about 10 miles long, over which there is a least depth of 36 feet (11m0), and upon which the last mentioned obstruction also stands,  
 55 extends north-eastward from a position about one mile eastward of Banka Dnestrovskaya. Two patches, one of 49 feet (14m9), and one

*Charts 2213, 2212.*

of 33 feet (10m1) lie, respectively, 2½ and 5 miles east-north-eastward of the 25-foot (7m6) obstruction.

A 29-foot (8m8) and a 32-foot (9m8) patch lie respectively 5 miles, and 4½ miles east-north-eastward of Dnestrovsko-Tsaregradskoye girlo. 5

**Cautions.**—Caution should be exercised when approaching the coast, particularly in low visibility, and soundings should be taken continuously as the low-lying coast is difficult to recognise.

Numerous fishing nets may be encountered between Mys Burnas (45° 49' N., 30° 08' E.) and Dnestrovsko-Tsaregradskoye girlo, and in 10 the approaches to Port Odessa (page 220).

**Anchorage.**—Anchorage may be obtained in the open roadstead opposite Dnestrovsko-Tsaregradskoye girlo.

**Climatological information.**—See pages 28 and 53.

**DNESTROVSKIY LIMAN AND PORT BELGOROD-DNESTROVSKIY.**—Dnestrovsko-Tsaregradskoye girlo (46° 04' N., 30° 28' E.), 15 is the entrance passage to Dnestrovskiy liman which latter extends north-westward for about 23 miles. The lagoon has general depths of from 5 to 8 feet (1m5 to 2m4), and Reka Dnestr flows into its head. The lagoon is separated from the sea by two narrow peninsulas which almost meet at 20 Dnestrovsko-Tsaregradskoye girlo, the northern of which is Kosa Bugaz on which is situated a prominent Customs house. A railway runs on both peninsulas.

Reka Dnestr is navigable for small craft up to 6 feet (1m8) in draught as far as Bendery, a distance of 70 miles. The river entrance requires 25 constant dredging; within the river there are depths varying from 13 to 36 feet (4m0 to 11m0) for some distance. This deep part of the river terminates abruptly in Ozero 'Yelyay, a lake with general shallow depths of 5 to 6 feet (1m5 to 1m8), situated about 11 miles northward of the 30 river entrance.

Depth signals to indicate the depth on the bar of the river are displayed from a look-out house by means of balls, the larger ones each indicating a depth of one foot (0m3), and the smaller ones a depth of 3 inches (0m1). 30

The village of Shabo about 5 miles north-westward of Dnestrovo-Tsaregradskoye girlo has a prominent church. Port Belgorod-Dnestrovskiy (46° 11' N., 30° 21' E.), 4 miles farther northward is suitable only for small vessels with draught up to 5 feet (1m5). Larger vessels must anchor outside the lagoon; see above. 35

An extensive area, in which the general depths are about 7 feet (2m1), 40 off-lies the wharves; a detached shoal, with a depth of 4 feet (1m2) over it, lies in the centre of this area nearly 1½ miles north-eastward of the Cathedral at Belgorod-Dnestrovskiy.

The town of Ovidiopol' is situated on the eastern side of the estuary, about 10 miles within the entrance. The approach to the jetty at the 45 town is marked by spar buoys on either side.

Between the town of Belgorod-Dnestrovskiy and the entrance to Reka Dnestr, about 7 miles north-westward, the eastern side of the channel is indicated by spar buoys surmounted by two cones, bases together; three mooring buoys lie in this area and are situated about 2½, 4½ and 6 cables 50 north-north-westward, respectively, of the Cathedral.

**Dnestrovsko-Tsaregradskoye girlo.**—**Navigational aids.**—The entrance is fronted by a bar, on which the depth, in 1964, was 8 feet (2m4). Within the bar, the depths increase abruptly to 19 to 40 feet (5m8 to 12m2), between the entrance points but decrease again to less 55



**Charts 2213, 2212.**

than the depths over the bar for a short distance within these points. In 1968, a channel was dredged to 10 feet (3m1) across the bar.

- A stony shoal, with a depth of 3½ feet (1m1) over it, lies on the southern side of the inner part of the entrance, 3 cables north-westward of Dnestrovsko-Tsaregradskoye girlo.

- Dnestrovsko-Tsaregradskoye girlo light (46° 04' N., 30° 28' E.) is exhibited at an elevation of 67 feet (20m4) from a truncated wooden pyramid, the upper part consisting of a black framework, 57 feet (17m4) in height, situated near the eastern end of the sandy peninsula-forming the southern entrance point.

- Leading lights for Tsaregradskoye girlo have been established on the southern entrance point; their positions are altered to meet changes in the channel. The front light is exhibited at an elevation of 44 feet (13m4) from a red metal framework tower, the seaward side of which has a red daymark with a white central stripe, surmounted by a red triangle point up, 39 feet (11m9) in height; the rear light is exhibited at an elevation of 64 feet (19m5), from a similar structure surmounted by a red triangle, point down, 59 feet (18m0) in height; in 1967, these lights were in line bearing 265° 24'.

When navigation is closed, or when the rear beacon cannot be placed owing to changes in the channel, the rear light is extinguished and a red fixed light is exhibited from the front light-structure in lieu of the normal light.

- No. 7 conical light-and-whistle buoy, fitted with a radar reflector and painted in black and white bands, exhibiting a white flashing light every one-and-a-half seconds, is moored one mile eastward of the entrance, close southward of the alignment of the leading light-structures.

- The entrance channel is marked on its north-eastern side by black spar buoys surmounted by black broom topmarks, open parts down: the south-western side is marked by red spar buoys surmounted by black broom topmarks, open parts up.

- Pilotage.—Pilot station.**—Vessels without local knowledge should not attempt to enter without a pilot. There is a pilot station on the southern side of the entrance.

**Signals.**—The following current signals are displayed on a mast near the front leading light-structure:—

A black cone, point down, or, at night, a white light above a green light, indicates that the current is running out of the entrance.

- A black cone, point up, or, at night, a green light above a white light, indicates that the current is running into the entrance.

**Chart 2213.**

- Dnestrovsko-Limanskiy kanal.—Navigational aids.**—Dnestrovsko-Limanskiy canal connects Dnestrovsko-Tsaregradskoye girlo with Port Belgorod-Dnestrovskiy. The channel is marked by light-buoys and by spar buoys. The depth on the axis of the channel was 11½ feet (3m5), in 1966. The channel consists of two reaches, each equipped with leading lights.

- The front beacon for the first reach stands on Kosa Burgaz (46° 04' N., 30° 28' E.), and consists of a white diamond-shaped structure with a black stripe in the middle, with a white diamond topmark, 60 feet (18m3) in height, from which a light is exhibited at an elevation of 63 feet (19m2).

The rear leading light for the first reach is exhibited, at an elevation of 75 feet (22m9) from a window in a white building, with a black stripe.

- These lights in line bear 349°–169°.

The leading light beacons for the second reach are situated in the

**Chart 2213.**

south-eastern part of Gorod Belgorod-Dnestrovskiy and when in line bear  $319^{\circ} 18' - 139^{\circ} 18'$ .

The front light for the second reach is exhibited at an elevation of 65 feet (19m8) from a white diamond shaped structure with a black stripe in the middle surmounted by a white diamond topmark, 61 feet (18m6) in height. 5

The rear light for the second reach is exhibited at an elevation of 100 feet (30m5) from a black diamond shaped structure with a white stripe in the middle surmounted by a black diamond topmark 60 feet (18m3) in height. 10

**Trade.**—The principal exports from places on the shores of the lagoon are grain, fish and tobacco. A number of small craft are used for transporting produce from the quays to vessels at Tsaregradskoye girlo.

**Ice.**—Dnestrovskiy liman is covered almost every year with solid ice; in severe winters the ice attains a thickness of 18 inches (0m5), so that communication across the lagoon can be established. Not infrequently during the winter the ice breaks up and the lagoon becomes free from ice. 15

Observations extending over 20 years show that ice appeared 9 times in November, 9 times in December, twice in January, and cleared 4 times in February, 15 times in March, and once in April. The average number of days with ice is about 80, but it varies from 35 to 125 days. 20

Tsaregradskoye girlo does not freeze every year, but is covered with floating ice every time the ice breaks up in the lagoon and is carried out to sea; in some years the ice is driven back again to the entrance. 25

The sea outside is sometimes covered with floating ice as far as can be seen. Its duration, not counting the time it is being swept out of the lagoon, is from a few days to one month.

See also page 28.

30

**Charts 2213, 2212.**

**DNESTROVSKIY LIMAN TO MYS LANZHERON.—Aspect.**—From Dnestrovsko-Tsaregradskoye girlo ( $46^{\circ} 04' N.$ ,  $30^{\circ} 28' E.$ ) the coast trends north-north-eastward for about 17 miles to the entrance to Sukhoy liman, thence a further  $4\frac{1}{2}$  miles to Mys Bol'shoy Fontan. From Mys Bol'shoy Fontan the coast runs northward for about 5 miles to Lanzheron-skiy and onward a further  $1\frac{1}{2}$  miles to Mys Lanzheron. This stretch of coast is steep with frequent precipitous, clay cliffs, at the foot of which lie landslides consisting of several parallel rows of hummocks or ridges, intersected in places by ravines; northward of Mys Bol'shoy Fontan, there are numerous houses and gardens. 35 40

**Coast.—Light.—Dangers.**—The village of Zatoka ( $46^{\circ} 08' N.$ ,  $30^{\circ} 31' E.$ ) is situated near the northern end of Kosa Bugaz, with Sanzheyka  $6\frac{1}{2}$  miles farther north-north-eastward.

Sanzheyskiy light is exhibited at an elevation of 73 feet (22m2) from a metal framework tower 16 feet (4m9) in height situated about one mile southward of Sanzheyka village. 45

Northward of Sanzheyka the coast is less steep and inclines gradually to a narrow sandy ridge within which is Sukhoy liman.

Between Dnestrovsko-Tsaregradskoye girlo and the entrance to Sukhoy liman the coast is fringed by a bank with depths of less than 36 feet (11m0) which extends about  $3\frac{1}{2}$  miles offshore in the latitude of Zatoka but gradually narrows until it is only about 4 cables offshore opposite the entrance to Sukhoy liman. 50

Two obstructions with depths respectively of 16 and 19 feet (4m9 55

*Charts 2213, 2212.*

and 5m8) lie half a mile offshore about  $2\frac{1}{2}$  miles north-eastward of Zatoka.

Two obstructions, with depths of 19 feet (5m8) over them, lie three-quarters of a mile south-eastward and one mile east-north-eastward, respectively, of Sanzheyskiy light-structure; an obstruction, with a depth of 2 feet (0m6) over it, lies nearly  $1\frac{1}{2}$  miles north-eastward of the light-structure.

**Sukhoi liman.—Port of Il'ichevsk.—Navigational aids.**—Sukhoi liman comprises an outer and inner basin; the coaling port of Il'ichevsk (46° 18' N., 30° 39' E.) is mainly situated on the south-western side of the outer basin. From northward and westward the port is protected by high land, and from southward it is protected from the sea by two converging sandy spits between which lies the dredged entrance channel confined within two small breakwaters. With strong winds between north-east and south there is a swell in the entrance channel making entry difficult in these conditions.

From the offing Sukhoi liman appears as a valley, on the south-western side of which is the town of Aleksandrovka, with a factory and some chimneys and tanks southward of it.

Il'ichevsk light is exhibited, at an elevation of 66 feet (20m1), from a metal framework tower, situated on the elbow of the southern breakwater, just over one mile east-south-eastward of the front leading light-structure, *see below*. In poor visibility, an auxiliary light is exhibited from this light-structure.

Severnny Portovyy light-tower stands on the northern entrance point, at an elevation of 26 feet (7m9).

The approach to the harbour is indicated by a conical light-and-whistle buoy, fitted with a radar reflector and painted black and white in bands, exhibiting a *white flashing* light *every five seconds*, moored about 2 miles east-south-eastward of the breakwater heads.

The entrance to the harbour is marked by a pair of leading light-beacons situated on the north-western shore of the outer basin, close south-eastward of the town of Aleksandrovka (46° 19' N., 30° 38' E.). The front light-beacon is a black metal framework structure carrying a white square daymark with a black central stripe, 92 feet (28m0) in height, from which a light is exhibited at an elevation of 151 feet (46m0); in addition, during the hours of darkness a *green* luminous stripe is exhibited from the white shield. The rear light-beacon is a similar structure but carries a white rectangular daymark with a black central stripe, 68 feet (20m7) in height, from which a light is exhibited at an elevation of 213 feet (64m9); in addition, during the hours of darkness a *red* luminous stripe is exhibited from the white daymark. In line, these lights bear  $288\frac{1}{2}^\circ$  and lead through the entrance channel between the breakwaters.

The channel is marked on either side by conical light-buoys fitted with radar reflectors; unlit spar buoys are moored between the light-buoys on both sides of the channel. The light-buoys are numbered in white from shoreward: those marking the northern side of the channel are painted black with odd numbers and exhibit *white flashing* lights *every three seconds*; those marking the southern side are painted red with even numbers and exhibit *red flashing* lights *every three seconds*. Nos. 4, 6 and 8 on the southern side and No. 5 on the northern side are bell-buoys.

At the inner end of the dredged channel, *West* light-buoy, painted red and white in stripes with a topmark painted white over red, fitted with a radar reflector, and exhibiting a *red flashing* light *every two and a half seconds*, is moored about 3 cables east-south-eastward of the front leading

**Charts 2213, 2212.**

light-structure. This light-buoy marks the position for altering course towards the inner basin.

Light-beacons are situated on the southern side of the dredged channel about 9 cables east-south-eastward and on the northern side about 3 cables east-south-eastward, of the front leading light-structure; these light-beacons are white metal framework towers 23 feet (7m0) in height, from each of which a light is exhibited at an elevation of 28 feet (8m5).

Light-beacons are situated on the heads of the inner western and eastern breakwaters, situated about 6 cables north-north-eastward of the front leading light-structure; these light-beacons are red metal framework towers, 21 feet (6m4) in height, from each of which a light is exhibited at an elevation of 34 feet (10m4).

In addition to these inner breakwater lights, ferry crossing lights are exhibited. Three *green* lights, disposed vertically, indicate that the entrance between these breakwaters is open; three *red* lights, similarly disposed, indicate that the entrance is closed.

**Quays.**—Within the harbour, on its south-western side, there are two quays: one is about 1,148 feet (349m9) in length: the other is about 820 feet (249m9) in length. In 1968, harbour extension works were in progress, on the extension of the quayage, and elsewhere in the port ( $46^{\circ} 18' N.$ ,  $30^{\circ} 39' E.$ ).

**Depths.**—In 1967, the depths on the axis of the dredged channel was 40 feet (12m2); the official limiting draught for vessels entering is restricted to 30 feet (9m1). The depth alongside the quays are between 30 and 32 feet (9m1 and 9m7) in 1967.

**Pilotage.**—**Signal station.**—**Traffic regulations.**—**Radio station.**—Pilotage is compulsory. The pilot is embarked in the vicinity of the approach light-and-whistle buoy; the pilot offices are situated near the quays. Vessels proposing to enter must request the services of a pilot by radio not less than 4 hours before reaching the pilot ground; during stormy weather, vessels awaiting a pilot must anchor in the anchorage area (*see below*) until the weather improves. Vessels proposing to leave the port must request the services of a pilot and tugs from the Port Director not less than 4 hours before the time of departure.

A signal station with a mast 36 feet (11m0) high stands on the head of the southern breakwater; it is equipped with a searchlight, a radio telephone and a radio location system. All movements of vessels in the roadstead the entrance channel, and the dredged channel are controlled by signals from the signal mast. There is a radio station in the port for communicating with vessels.

**Directions.**—The recommended track for a vessel approaching Sukhoy liman is the same as that for a vessel approaching Odesskiy port, *see page 221*; when 6 miles east-south-eastward of the harbour entrance, a vessel should steer for the light-and-whistle-buoy 2 miles off the entrance, keeping on the alignment of the leading light-structures bearing  $288\frac{1}{2}^{\circ}$ .

**Anchorage area.**—**Spoil ground.**—An anchorage area about one mile in extent is indicated on the chart southward of the harbour approach with its centre about  $1\frac{1}{4}$  miles south-south-eastward of the signal station; the bottom is sandy.

Anchoring in the inner harbour, or securing to mooring buoys, is only possible with the prior permission of the harbour authorities, and then only under the direction of a pilot.

A spoil ground lies northward of the harbour approach, about 2 miles east-north-eastward of the signal station. It is marked by a light-buoy, painted red and white in bands, with a white cross on each side, exhibiting

*Charts 2213, 2212.*

a green flashing light every three seconds, moored in the centre of the spoil ground.

A shoal, with a depth of 29 feet (8m8) over it, lies  $1\frac{1}{2}$  miles east-north-eastward of the signal station ( $46^{\circ} 19' N.$ ,  $30^{\circ} 40' E.$ ).

**Port facilities.**—The port is primarily used for the shipment of coal and molasses in bulk, and is suitable for vessels with a draught of up to 30 feet (9m1). The quays are equipped with about 20 electric cranes up to 15 tons capacity, plus some smaller units. The quays, at which two 10,000-ton vessels and some coasters can berth, are rail served and the port is connected by rail with Odessa, to which there is also a regular bus service. Owing to the congestion in the harbour, considerable delay may be experienced at the anchorage before proceeding alongside.

Fresh water can be obtained at the quays, and is also supplied by water tanker to vessels at mooring buoys or at anchor. Supplies of fresh provisions and coal can be obtained.

Fuel oil for bunkering is available and is supplied from a 600-ton self-propelled barge; this oil is shipped from Odessa and supplies are liable to be interrupted in bad weather.

A small shipyard is situated northward of the quays, and repairs to hulls and engines can be undertaken. There is a floating dock capable of accommodating vessels up to 30,000 tons.

There are six sea-going tugs and six harbour launches. In addition the port is equipped with a salvage ship, an ice-breaker, fire-fighting launches and some barges.

There are three floating cranes, two with lifting capacities of 200 tons and one of 100 tons.

A small quay on the north-eastern side of the outer basin is reserved for trawlers and harbour area ferries.

**De-ratting.**—De-ratting can be carried out.

**Ice.**—All the year round navigation is possible except in very hard winters.

**Sukhoi liman to Mys Lanzheron.—Dangers.—Navigational aids.**

**—Caution.**—Between the entrance to Sukhoi liman and Mys Bol'shoi Fontan ( $46^{\circ} 22' N.$ ,  $30^{\circ} 45' E.$ )  $4\frac{1}{2}$  miles north-eastward the coastal bank over which there are depths of up to 36 feet (11m0) extends about 8 cables offshore and within these limits there are many patches and obstructions, the positions of which can best be seen on the chart. Chernomorka village surrounded by orchards and plantations is situated in a valley about 2 miles south-westward of Mys Bol'shoi Fontan.

Mys Bol'shoi Fontan rises vertically to an elevation of 125 feet (37m8). Bol'shoi Fontan village is situated about one mile north-north-westward of the eastern extremity of the cape.

Odesskiy light is exhibited, at an elevation of 212 feet (64m6), from a white, iron, diagonal framework structure with a central column, 78 feet (23m8) in height, situated about 3 cables north-westward of the eastern extremity of the cape. This light also shows a vertical beam.

A fog signal is sounded from the eastern extremity of the cape and a radiobeacon transmits from a position near the light-structure.

Mys Bol'shoi Fontan is fringed by sunken rocks and a bank with depths of less than 30 feet (9m1) extends about 4 cables from the point. A spar buoy is moored on the 5-fathom (9m1) line about 4 cables south-eastward of the point.

Mys Bol'shoi Fontan should be given a wide berth and vessels should keep in depths of not less than 60 feet (18m3) in its vicinity.

*Mys Bol'shoi Fontan No. 1* can light-and-whistle-buoy, painted red

**Charts 2213, 2212.**

and white in bands and fitted with a radar reflector and exhibiting a *red flashing* light, is moored about  $1\frac{1}{2}$  miles east-south-eastward of Mys Bol'shoy Fontan.

Between Mys Bol'shoy Fontan and Lanzheronskiy ( $46^{\circ} 27' N.$ ,  $30^{\circ} 46' E.$ ), about 5 miles northward, the coastal bank, with depths of up to 36 feet (11m0), on which are many sunken obstructions, extends up to 5 cables offshore.

**Charts 2206, 2212.**

A conspicuous radio tower from which *red* obstruction lights are exhibited is situated about  $2\frac{1}{4}$  miles north-westward of Lanzheronskiy light (*see below*). Its charted position is approximate.

Lanzheronskiy light is exhibited at an elevation of 98 feet (29m9) from a grey tower, 66 feet (20m1) in height, situated on the coast about  $1\frac{1}{2}$  miles southward of Mys Lanzheron.

A red and white spar buoy, surmounted by two cones, points together, is moored about 11 cables south-south-eastward of Lanzheronskiy light-structure.

**Spoil ground.—Light-buoy.**—An area of spoil ground, one mile in diameter, lies with its centre 4 miles eastward of Lanzheronskiy light-structure.

A red light-buoy, with a superstructure painted red and white in bands and with a white cross on each side, exhibiting a *green flashing* light *every three seconds*, is moored in the centre of the spoil ground.

**Outlying light-buoys.**—Nos. 2 and 3 black and white conical light-buoys, each exhibiting a *white flashing* light *every five seconds*, are moored respectively,  $16\frac{1}{2}$  miles east-south-eastward and 10 miles eastward of Lanzheronskiy light-structure. No. 2 light-buoy is fitted with a radar reflector.

**Prohibited areas.—Buoyage.**—An area in which anchoring and fishing are prohibited extends eastward from the coast in the southern approach to Odesskiy zaliv, with its northern limit situated about  $1\frac{1}{2}$  miles south-eastward of Mys Lanzheron; its limits are indicated on the chart.

An area, prohibited to all vessels, extends eastward from the coast in the vicinity of Lanzheronskiy light-structure, in the north-western part of the above prohibited anchorage area; its limits are also indicated on the chart.

A conical light-buoy, painted red and white in stripes and fitted with a radar reflector, exhibiting a *red flashing* light *every two and-a-half seconds*, is moored close eastward of the prohibited area, in a position about 7 cables eastward of Lanzheronskiy light-structure.

**Local Magnetic anomaly.**—Between Sukhoy liman and the entrance to Dneprovskiy liman (page 233), the magnetic variation is largely affected by local influences and varies from  $5^{\circ} W.$  to  $9^{\circ} E.$  (1964).

**Life-saving.**—There are life-saving stations on the coast near the villages of Chernomorka ( $46^{\circ} 21' N.$ ,  $30^{\circ} 42' E.$ ), Bol'shoy Fontan, and at Mys Lanzheron. A lifeboat is stationed at Chernomorka and at Mys Lanzheron. *See also page 25.*

**ODESSKIY ZALIV.—Aspect.—Navigational aids.**—Odesskiy zaliv is entered between Mys Lanzheron ( $46^{\circ} 28' N.$ ,  $30^{\circ} 46' E.$ ) and Mys Severnyy Odesskiy, about 5 miles north-north-eastward. From the former point the coast is at first shelving and then becomes low and sandy. Within the head of the bay are Khadzhibe'yskiy liman and Kuyal'nitskiy liman, two lagoons which are separated from each other

*Charts 2206, 2212.*

by a steep ridge extending seaward and terminating south-eastward in Gora Zhevakova, a steep bluff 154 feet (46m9) high. Between the lagoons and the head of the bay lies the sandy plain of Peresyp'.

- 5 Odesskiy port (page 222), protected by breakwaters, lies in the south-western part of the bay, the shore of which is occupied by the various port buildings and within which lies the city of Odessa. The suburb of Peresyp' lies on the plain of the same name northward of the city, with that of Baltovka farther northward.
- 10 Vorontsovskiy light is exhibited, at an elevation of 89 feet (27m1), from a white, circular tower, 84 feet (25m6) in height, situated on the head of Reydivyy mol, on the eastern side of the entrance to Odesskiy port and about  $1\frac{1}{4}$  miles northward of Mys Lanzheron. A fog signal is sounded, and a radiobeacon transmits, from the light-structure.
- 15 A light is exhibited at an elevation of 180 feet (54m9) from a white hut on the roof of a building, 65 feet (19m8) in height, situated 12 cables west-south-westward of Vorontsovskiy light-structure, with which it is in line bearing  $250\frac{1}{2}^{\circ}$ . An auxiliary light is exhibited by day from this light-structure.
- 20 **Pilotage.**—Vessels proceeding to Odessa ( $46^{\circ} 29' N.$ ,  $30^{\circ} 45' E.$ ) must give 24 hours notice to the port authorities and request the services of a pilot at the same time; the precise time of arrival must be given 6 hours before arrival at the outer roadstead. The pilot is embarked in the vicinity of Vorontsovskiy light-structure.
- 25 When necessary to move a vessel in port, or to leave port, the request for a pilot must be made 2 hours in advance.

- Pilotage for vessels proceeding from Odessa to Kherson is compulsory; request for the pilot must be radioed to the Captain of the Port, Odessa, 6 hours beforehand and the time of arrival off Vorontsovskiy lighthouse must be stated. The sea pilot is embarked in the vicinity of the light-house; when weather conditions render it impossible to embark the pilot, vessels must remain at anchor until the weather improves. Information regarding buoyage in the Odessa, Kherson, Nikolayev and Karkinitzkiy zaliv regions can be obtained at the pilot office. *See also*
- 35 *pages 14, 15 and 231.*

**Regulation as to entry.**—No foreign vessels are permitted to enter or leave the port of Odessa unless the flag is displayed from the quarantine establishment signifying that the officers are on duty.

- All vessels arriving from abroad will stop in the outer roadstead, without communicating with the shore, and with the quarantine flag displayed until the medical inspection is finished. *See Quarantine Regulations, page 15 and page 226.*
- 40

- Vessels with explosives must remain in the bay until instructions are received from the port authorities, who must at once be communicated
- 45 with.

Vessels entering the bay or harbour must give way to vessels leaving. Vessels are forbidden to anchor in the fairway.

Vessels in the harbour may only proceed at slow speed, passing dredgers or diving apparatus at very slow speed.

- 50 **Range of water level.**—North-westerly winds cause the water level to fall as much as 2 feet (0m6) below the normal, and easterly winds have the opposite effect. *See also pages 37–38.*

**Dangers in Odesskiy zaliv.—Buoy.**—For the bank fronting Mys Lanzheron, *see page 218.*

- 55 A bank over which the depths are less than 36 feet (11m0) and are very irregular, extends 3 miles south-south-westward and about  $1\frac{1}{4}$  miles

*Charts 2206, 2212.*

southward from Mys Severnyy Odesskiy ( $46^{\circ} 32' N.$ ,  $30^{\circ} 49' E.$ ). The southern extremity of the bank, over which there is a depth of 29 feet (8m8), is marked by a light-buoy, painted red and exhibiting a *red flashing light every five seconds*, moored  $1\frac{1}{2}$  miles east-north-eastward of Vorontsovskiy light-structure. 5

A rock, with a depth of 16 feet (4m9) over it, and with a 17-foot (5m2) patch  $3\frac{1}{2}$  cables westward of it, lies 2 miles south-south-westward of Mys Severnyy Odesskiy; a 17-foot (5m2) patch, with an 18-foot (5m5) patch close north-westward of it, lies  $1\frac{1}{2}$  miles southward of the point. There 10 is a 32-foot (9m8) patch 2 miles southward of Mys Severnyy Odesskiy.

Two red spar buoys, each surmounted by a cone, point down, and fitted with a radar reflector, are moored close seaward of the 6-fathom (11m0) line  $2\frac{1}{2}$  miles east-south-eastward and  $1\frac{1}{2}$  miles south-south-eastward, respectively, of Mys Severnyy Odesskiy. 15

**Caution.**—Vorontsovskiy light-structure in line with the light-structure 12 cables west-south-westward, bearing  $250\frac{1}{2}^{\circ}$ , leads southward of the dangers described above, but leads across the southern extremity of the bank in a least depth of 29 feet (8m8). Deep draught vessels approaching Odesskiy port from eastward should, when about  $2\frac{1}{2}$  miles from Vorontsovskiy light-structure, steer to pass southward of the light-buoy marking the southern extremity of the bank,  $1\frac{1}{2}$  miles east-north-eastward of the light-structure. 20

**Obstructions.**—There are several obstructions in Odesskiy zaliv; seven of these lie between positions half a mile south-south-eastward and 2 miles west-south-westward of Mys Severnyy Odesskiy. 25

An obstruction, with a depth of 32 feet (9m8) over it, lies 2 miles southward of Mys Severnyy Odesskiy.

Foul ground lies about 7 cables northward of Vorontsovskiy light-structure. Another obstruction lies 4 cables south-south-eastward of the light-structure. 30

**Prohibited anchorage.**—**Prohibited area.**—**Anchorage areas.**—**Mooring buoys.**—Anchoring is prohibited within a radius of  $1\frac{1}{2}$  cables of the obstruction 2 miles southward of Mys Severnyy Odesskiy.

An anchorage area, one mile in width, is established between  $2\frac{1}{2}$  and 5 miles eastward of Vorontsovskiy light-structure ( $46^{\circ} 29' N.$ ,  $30^{\circ} 45' E.$ ). Four mooring buoys are moored close northward of this area,  $3\frac{1}{2}$  miles eastward of Vorontsovskiy light-structure. 35

Two anchorage areas for non-degaussed vessels are established. One area, half a mile in diameter, for large vessels, has its centre  $2\frac{1}{2}$  miles eastward of Vorontsovskiy light-structure; the other area, about one mile in extent, is established northward of the alignment of the leading light-structures bearing  $250\frac{1}{2}^{\circ}$ , with its centre about one mile north-eastward of Vorontsovskiy light-structure. 40

**Directions.**—The recommended track for a vessel approaching Odesskiy port from southward leads from a position in Lat.  $45^{\circ} 56' N.$ , Long.  $30^{\circ} 54.2' E.$ , northward to the light-and-whistle-buoy  $1\frac{1}{2}$  miles east-south-eastward of Mys Bol'shoi Fontan, thence to a position 2 miles eastward of Mys Lanzheron, and thence to a position half a mile east-north-eastward of Vorontsovskiy light-structure. The latter part of this track is shown on chart 2206. Between the light-and-whistle-buoy and Mys Lanzheron, northbound vessels should keep slightly eastward of the recommended track and southbound vessels slightly westward of it. 50

The recommended track for a vessel approaching from eastward is along the alignment of Vorontsovskiy light-structure and the light- 55



*Charts 2206, 2212.*

structure 12 cables west-south-westward, bearing  $250\frac{1}{2}^{\circ}$ , but *see* caution on page 221.

**Odesskiy reyd.—Avanport.—Anchorage.—Prohibited anchorage.**  
—Odesskiy reyd comprises that part of the bay within a line joining 5  
Vorontsovskiy light-structure ( $46^{\circ} 29' N.$ ,  $30^{\circ} 45' E.$ ) and Mys Severnyy Odesskiy. The bottom consists, chiefly of soft mud with sand and shells and is good holding ground. In many places the soft mud is underlaid by very stiff mud and clay, and it is advisable to sight the anchor occasionally.

Vessels can find anchorage in the bay or proceed into the inner road 10  
or avanport, which lies between the heads of the inner moles and Odesskiy breakwater, *see* below; to await the visit of the port authorities. There are a number of mooring bollards at convenient distances along the inner side of Odesskiy breakwater, and also several mooring buoys to which vessels can secure their sternfasts. 15

Vessels lying in Odesskiy zaliv should always keep a second anchor ready for letting go in case they should part the cable in a heavy squall.

Anchoring and fishing are prohibited within about 120 feet (36m) westward of Reydovyy mol, and within the area, indicated on the chart, between Reydovyy mol and the eastern end of Odesskiy breakwater. 20  
*Chart 2206.*

**Odesskiy port.—Breakwaters.—Lights.**—The several harbours comprising Odesskiy port are completely sheltered from sea or swell by breakwaters. Strong southerly winds are sometimes experienced in winter and these cause a heavy sea and make entrance into the harbour 25 difficult.

The easternmost breakwater extends about three-quarters of a mile northward from a position about half a mile north-north-westward of Mys Lanzheron. Its inner part is known as Karantinnyy (Quarantine) 30  
mol and has a short spur, 50 yards (45m7) long, at its outer end; its outer part is known as Reydovyy mol.

Vorontsovskiy light, situated on the head of Reydovyy mol, is described on page 220.

Odesskiy breakwater extends about  $6\frac{1}{2}$  cables west-north-westward, roughly parallel with the shore, from a position about  $1\frac{1}{2}$  cables south- 35  
westward of the head of Reydovyy mol. A light is exhibited, at an elevation of 35 feet (10m7), from a metal framework structure with platform, situated at each end of Odesskiy breakwater.

Novyy breakwater extends 3 cables northward from a position about 2 cables north-north-eastward of the western end of Odesskiy break- 40  
water.

The four smaller harbours, Karantinnaya (Quarantine), Novaya (New), Kabotazhnaya (Coaster), and Prakticheskaya (Pratique) ( $46^{\circ} 29' N.$ ,  $30^{\circ} 44' E.$ ) in that order from east to west, are fronted by Odesskiy break- 45  
water. The entrances at either end of this breakwater are each 350 yards (320m0) wide, with depths of about 30 feet (9m1) in the eastern and of about 25 feet (7m6) in the western. A 17-foot (5m2) patch lies  $1\frac{1}{2}$  cables westward of the western end of Odesskiy breakwater.

There are a few mooring buoys in each of these harbours.

In the northern part of Odesskiy port, Gavan' Zavoda (Repairing 50  
basin) and Rabochaya (Working) and Neftyanaya (Petroleum) harbours, are situated abreast Peresyp' and are sheltered by Novyy breakwater.

**Traffic and storm signals.**—Traffic and storm signals are displayed from a mast situated on the central part of Karantinny mol. *See* pages 18–20. 55

Storm signals are also displayed at the root of Voyennyy mol (page 224).

## Chart 2206.

**Entrances.—Navigational aids.—Prohibited area.**—Except for some vessels using *Prakticheskaya gavan'*, the eastern entrance is used by vessels entering the four southern harbours, and the western by vessels entering the three northern harbours.

A dredged channel, about 300 feet (91m4) wide and with a least depth on the centre line of 43½ feet (13m2) in 1968, leads from *Odesskiy zaliv* into *Neftyanaya gavan'* (page 225). It commences about 2½ cables northward of the eastern end of *Odesskiy breakwater*, the outer part leading to a position between the western end of that breakwater and the southern end of *Novyy breakwater*, and the inner part leading thence into *Neftyanaya gavan'* (45° 30' N., 30° 44' E.). The sides of the dredged channel are marked by spar buoys in accordance with the systems described on pages 22 to 24.

In addition to the above buoyage, the northern and eastern sides of the two parts of the dredged channel are also marked by three light-buoys, all fitted with radar reflectors and exhibiting *white flashing* lights. Of these, *No. 5* light-buoy, the outer one, painted black, is moored 3½ cables east-north-eastward of the western end of *Odesskiy breakwater*; *No. 3* light-and-whistle-buoy, which is painted black and white in bands, marks the north-eastern side of the junction between the outer and inner parts of the dredged channel and is moored 2 cables north-north-westward of the western end of the breakwater; *No. 1* light-buoy painted black, the inner of the three, is moored 3 cables north-north-westward of the western end of the breakwater.

Leading light-beacons for the outer part of the dredged channel stand westward of *Odesskiy breakwater*. The front light is exhibited, at an elevation of 33 feet (10m1) from a metal framework beacon carrying a white square daymark with a black central stripe and a diamond topmark, 34 feet (10m4) in height, situated 2½ cables west-north-westward of the western end of *Odesskiy breakwater*; the rear light is exhibited at an elevation of 82 feet (25m0), from a white rectangular wooden shield and triangular topmark with a black stripe, 74 feet (22m6) in height, situated 2½ cables westward of the front light-beacon. In line these light-beacons bear 274½°.

Three cable light-buoys, painted black and yellow, fitted with radar reflectors and exhibiting *orange occulting* lights *every two seconds*, are moored about one cable apart in an east-west direction, on the southern side of the dredged channel; the eastern of these light-buoys lies 2½ cables west-north-westward of *Vorontsovskiy light-structure*. These light-buoys mark the northern limit of a prohibited area, indicated on the chart, on the northern side of *Odesskiy breakwater*.

Leading lights for the inner part of the dredged channel stand north-westward of *Neftyanaya gavan'*. The front light is exhibited at an elevation of 72 feet (21m9), from a metal post with a platform with a black trapezium-shaped daymark, 73 feet (22m3) in height, situated in the north-western corner of the basin; the rear light is exhibited at an elevation of 94 feet (28m7) from a three-sided column, 86 feet (26m2) in height, situated one cable north-north-westward of the front structure. In line, these light-beacons bear 327½°.

Leading lights have also been established for the use of vessels leaving *Neftyanaya gavan'*. The front light is exhibited at an elevation of 26 feet (7m9), from a mast, 20 feet (6m1) in height, situated about one cable within the western head of *Odesskiy breakwater*; the rear light is exhibited, at an elevation of 121 feet (36m9) from a framework beacon, 39 feet (11m9) in height, situated about one mile southward of *Voront-*

*Chart 2206.*

sovskiy light-structure. These light-beacons in line, bearing about  $147\frac{1}{2}^{\circ}$ , are reciprocal to those described above for the inner part of the dredged channel.

- 5 Vessels should not attempt to pass between the northern extremity of Novyy breakwater and the mole enclosing Neftyanaya gavan', which passage is covered by the *red* sector of the light on the elbow of the latter mole (*see* page 225) between the bearings of  $180^{\circ}$  and  $315^{\circ}$ . A shoal, with a depth of 8 feet (2m4) over it, lies one cable northward, and a 14-foot (4m3) patch three-quarters of a cable west-south-westward, of the northern end of Novyy breakwater.

**Inner harbours.—Moles and quays.—Depths.—Lights.**—Karantinnaya gavan' ( $46^{\circ} 29' N.$ ,  $30^{\circ} 45' E.$ ) lies between Karantinnyy mol on the east, and Platonovskiy (Platonovski) mol on the north-west, and 15 Bakaleinaya naberezhnaya, which is situated between their inner ends. There are depths of about 30 feet (9m1) in this harbour; in 1966, depths of 33 feet (10m1) were reported alongside Bakaleinaya naberezhnaya. This harbour is used by vessels arriving from abroad. Vessels lying here are subject to the quarantine and customs regulations and they are 20 berthed by the port pilot; special limits are assigned for those vessels which have to undergo quarantine.

Novaya gavan' lies between Platonovskiy mol and Novyy (New) mol; there are depths of 32 feet (9m8) in the entrance to this harbour, and of 33 feet (10m1) alongside Novyy mol.

- 25 Kabotazhnaya gavan' lies between Novyy mol and Voyennyy (Military) mol, the inshore ends of which are connected by Kabotazhnaya naberezhnaya; there are depths of about 30 feet (9m1) in the harbour. In 1964, it was reported that there were depths of about 27 feet (8m2) alongside the quay on the south-western side of Kabotazhnaya gavan'.

- 30 Voyennyy mol is the berthing place of passenger vessels plying in the Black sea. There are coal stores on Kabotazhnaya naberezhnaya and vessels can coal alongside.

- Prakticheskaya gavan' lies between Voyennyy mol, Androsovskiy mol, and Potapovskiy mol, which extends south-eastward from the outer end 35 of the latter. Arbuznaya naberezhnaya is situated between the inshore ends of Voyennyy mol and Androsovskiy mol. There are depths of 23 feet (7m0) in the entrance to Prakticheskaya gavan', but on the north-western side of the entrance there is a 17-foot (5m2) patch, marked by a light-buoy, painted black and exhibiting a *red flashing* light every two-and-40 *a-half seconds*; within the harbour there are depths of from 20 to 29 feet (6m1 to 8m8), but a 19-foot (5m8) patch lies three-quarters of a cable within the entrance, and an obstruction with a depth of 18 feet (5m5) over it, lie in the centre of the harbour, as shown on the chart.

- Prakticheskaya gavan' is used by vessels plying to Nikolayev and 45 Kherson and has nothing to do with pratique in the technical sense. The head of Potapovskiy mol is used by the local yacht club. There are several cranes on Arbuznaya naberezhnaya.

- Gavan' Zavoda lies north-westward of Androsovskiy mol and extends from southward between the head of this mole and the southern end 50 of a detached breakwater, partly submerged, which fronts Gavan' Zavoda and Rabochaya gavan'; the entrance is 420 feet (128m0) wide. Gavan' Zavoda is divided into three basins by short jetties; a shipyard occupies the shores of the harbour, and there are slipways in the southernmost basin. There are depths of from 20 to 25 feet (6m1 to 7m6) in Gavan' 55 Zavoda, but there is a 15-foot (4m6) patch in the northern basin,  $1\frac{1}{2}$  cables eastward of the rear leading light-structure of the  $274\frac{1}{2}^{\circ}$  alignment.

*Chart 2206.*

Rabochaya gavan' lies northward of Gavan' Zavoda; there is a depth of 19 feet (5m8) in the entrance, which lies between the northern end of the detached breakwater mentioned above and a short mole extending from the shore. The south-western corner of the harbour is shallow, with depths of less than 18 feet (5m5).

Two prominent chimneys, about three-quarters of a cable apart in a north/south direction, stand westward of this part of the harbour, and are situated nearly one mile south-westward of the head of the projecting outer mole of Neftyanaya gavan'.

Neftyanaya gavan' (Petroleum harbour) ( $46^{\circ} 30' N.$ ,  $30^{\circ} 44' E.$ ) lies about one mile northward of Prakticheskaya gavan' and is protected on its northern side by a mole which extends about  $3\frac{1}{2}$  cables east-south-eastward from the shore and thence south-westward for about  $1\frac{1}{2}$  cables. The sunken remains of an old mole, with depths of 11 feet (3m4) over them, extend, a short distance off the outer side of the elbow and the projecting south-western arm of this mole, which should be given a berth of at least half a cable.

A light is exhibited, at an elevation of 37 feet (11m3), from a green metal column, 20 feet (6m1) in height, on the elbow of the mole.

A light is exhibited at an elevation of 36 feet (11m0) from a black square framework structure, 30 feet (9m1) in height, situated on the head of the projecting arm of the mole.

The leading lights for the approach to Neftyanaya gavan' are described on page 223.

Vessels with a maximum draught of from 28 to 32 feet (8m5 to 9m8) can lie at sponsons on the inner side of the mole in the northern part of Neftyanaya gavan', and of 36 feet (11m0) at a T-headed wharf on the inner side of the projecting mole head; on the western side of this harbour there is an oil wharf suitable for vessels with a maximum draught of  $37\frac{1}{2}$  feet (11m4).

About 3 cables southward of the above oil wharf a prominent silo was under construction, in 1961, with a pier about one cable in length projecting eastward of it; vessels with a maximum draught of 36 feet (11m0) can lie alongside the northern side of the pier.

All operations in connection with naptha or petroleum are carried out in Neftyanaya gavan'.

**Pipeline.**—An above water pipeline, supported on metal piles, extends eastward for nearly 2 cables from a position on the shore about one cable northward of the root of the mole on the northern side of Neftyanaya gavan'.

**Port regulations.**—Vessels on arrival should obtain a copy of the port regulations. Extracts from these are as follows:—

The master of every vessel arriving in the port must, not later than 24 hours after arrival in the roadstead, hand in to the Port Board particulars of his vessel, crew and cargo, according to the form established by the Board.

Vessels in the bay or in the harbour must exhibit the regulation lights. Those in the Inner road within the breakwater, at the end of piers, or moored stern on to shore, must exhibit anchor lights and light at the ladders. Vessels moored alongside in the same harbours need only show lights on the stages.

No fires are permitted on board, excepting for the use of the engines and electric light.

Rubbish must not be thrown overboard either in the roads or in the harbour.

*Chart 2206.*

The firing of rockets and *blue* lights, the ringing of bells or frequent blowing of whistles or sirens, is prohibited, excepting as a signal of distress.

- 5 See also regulations as to entry, page 220.

**Quarantine regulations.**—For quarantine regulations, *see* page 15.

**De-ratting.**—De-ratting can be carried out; *see* page 27.

- Life-saving.**—There are life-saving stations, each with a lifeboat, at the head of Platonovskiy mol and on the coast at the head of Odesskiy zaliv, about 1½ miles west-north-westward of Mys Severnyy Odesskiy. The latter station is open only during the summer. *See* also page 25.

- 10 **Odessa.**—The city of Odessa (46° 29' N., 30° 44' E.), with a population of 753,000, in 1967, is situated about midway between Dnestrovskiy liman (Dnyestr estuary) and Dneprovskiy liman (Dnieper estuary), and is one of the principal trading places on the shores of the Black sea. It is built on a hill which rises rather steeply from the sea and has many fine buildings. A broad flight of steps, supported by arches, leads from the harbour up the hill side, which is 80 feet (24m4) high, to the boulevard, which is planted with trees and runs along the top of the slope, between it and the city.

**Trade.**—In addition to being the traditional outlet for the wheatlands of the Ukraine, Odessa has important oil refining and chemical plants and exports oil and chemical products.

- 25 The principal exports are grain, sugar, timber and wool. The chief imports are coal, cotton and agricultural machinery.

It is the main base of the U.S.S.R. Black Sea fleet, and also of the U.S.S.R. vessels which operate in the Antarctic.

**Port facilities.**—There is a military hospital, municipal and private hospitals and sanatoria at Odessa (46° 29' N., 30° 44' E.).

- 30 A large stock of coal is maintained. Coaling takes place alongside the coaling jetty or from lighters.

A large stock of fuel oil is maintained.

Fresh provisions and supplies are available. Fresh water is laid on to all the moles and quays.

- 35 All kinds of repairs can be undertaken.

Electric cranes of up to 45 tons capacity are available, and there are two floating cranes each of 100 tons.

There is a floating dock and two patent slips; for details of the former, *see* Appendix I.

- 40 The harbour is well supplied with tugs, icebreakers and salvage vessels.

**Communications.**—**Radio station.**—There is daily sea communication between Odessa and other Black sea ports, and regular and frequent sea communication with Istanbul; also with European ports both in the Mediterranean and elsewhere.

- 45 The city is connected with the general railway system which also serves all the quays and miles with the exception of Potapovskiy mol. There is a radio station at Odessa, *see* page 26.

**Climatic table.**—*See* page 76.

- 50 **Ice.**—In the approach to Odessa ice does not appear every year, but the harbours, in most years, are covered with ice; and for a short time there is communication on foot between the moles. In severe winters, immovable ice, 6 inches (0m15) thick, has been seen right up to Ochakov. In the open sea the ice is more frequently drift-ice from Dneprovskiy liman (Dnieper estuary) and does not hold for long.

- 55 Observations, extending over 18 winters in which ice appeared; show that ice appeared 9 times in December and 9 times in January, observa-

*Chart 2206.*

tions over 17 winters show that it cleared twice in January, 6 times in February, 8 times in March, and once early in April.

In the winter of 1910-11 the ice conditions were exceptionally severe. On January 31st a hard frost and the formation of ice occurred, and in the middle of February 46 vessels were icebound in the harbour, the ice being 3 feet (0m9) thick near the mouth of the harbour, and extending for 100 miles southward; no such severe winter had been experienced since 1882, when the port was icebound for 36 days.

The winter of 1924-25 may be quoted as a mild winter when ice did not appear.

In the winter of 1927-28, ice first appeared in Odesskiy zaliv on December 12th, and finally cleared at the beginning of April; complete congelation took place several times for short periods. Observations from Vorontsovskiy light-structure show that, in the open sea, ice first appeared on December 22nd and finally cleared on March 28th; complete congelation occurred twice, but the sea was entirely clear of ice from time to time. Navigation continued throughout the winter, with ice-breaker assistance when necessary.

In general it may be said that the port is open to navigation throughout the year, but assistance from ice-breakers is probably necessary for about 30 days each year.

*Chart 2212.***MYS SEVERNYY ODESSKIY TO BEREZANSKIY LIMAN.—**

**General remarks.**—From Mys Severnyy Odesskiy ( $46^{\circ} 33' N.$ ,  $30^{\circ} 49' E.$ ) to Mys Adzhiyask, about 22 miles eastward, the coast generally is moderately high and steep and is reddish in colour. Its uniform appearance is broken by several salt lakes which are separated from the sea by narrow ridges of sand, and by a number of villages. The whole of this stretch of coast is fronted by a bank which, with irregular depths of less than 36 feet (11m0), extends between half a mile and  $1\frac{1}{2}$  miles offshore. Odesskaya banka lies between  $2\frac{1}{2}$  and 4 miles off this coast, from which it is separated by Voyennyy farvater.

**Odesskaya banka.**—Odesskaya banka extends about 22 miles westward from the western side of Kinburnskaya kosa (Kinburn peninsula), a peninsula situated on the southern side of Dneprovskiy liman (Dniepr estuary) (page 231); it is composed of hard sand with depths of from 15 to 30 feet (4m6 to 9m1). There are several detached patches off the edges of the bank with depths of from 18 to 30 feet (5m5 to 9m1); the westernmost of these patches, with a least depth of 23 feet (7m0), lies about  $9\frac{1}{2}$  miles eastward of Vorontsovskiy light-structure. The northern side of Odesskaya banka forms the southern side of Voyennyy farvater and is steep-to, but the southern side of the bank is shelving.

**Caution.**—The buoys marking dangers in Voyennyy farvater cannot be relied upon.

**Western part of Voyennyy farvater.—Coast.—Life-saving.—**

**Navigational aids.—Dangers.**—From Mys Severnyy Odesskiy, the coast trends east-north-eastward and is high for about  $3\frac{1}{4}$  miles whence it slopes down to a sandy ridge which separates Bol'shoy Adzhalykskiy liman, the westernmost of the salt lakes, from the sea. Two moderately steep ravines, with settlements on their slopes, divide this stretch of coast into three almost equal parts. On the coast a short distance westward of the lake, there is a lime kiln with a high chimney.

Mys Dofinovskiy is formed by the coast rising from the eastern end of the sandy ridge, about 4 miles east-north-eastward of Mys Severnyy

*Chart 2212.*

Odesskiy; on its western slope is the village of Nova Dofinovka, in which there are numerous white buildings and gardens, above which, on higher ground, are other buildings.

- 5 A life-saving station, consisting of a two-storeyed building with a high tiled roof, is situated in the sandy ridge which separates Bol'shoy Adzhalykskiy liman from the sea; two lifeboats are stationed here.

An area of foul ground, extending up to three-quarters of a mile offshore, lies about  $1\frac{1}{2}$  miles west-south-westward of Mys Dofinovskiy.

- 10 A spar buoy, surmounted by a cone, point down, is moored close seaward of each outer corner of the foul area.

Between Mys Dofinovskiy and the south-western end of Adzhalykskiy or Grigor' yevskiy liman, lake about 4 miles east-north-eastward, the coast is high and is intersected, about midway, by the moderately wide

- 15 Nemetskaya or Chebanskaya balka, in which there are several small gullies. The lake is separated from the sea by a narrow sandy beach about three-quarters of a mile in length.

Grigor'yevka light is exhibited from a black square metal framework pyramid, 39 feet (11m9) in height, situated near the south-western corner

- 20 of Adzhalykskiy liman,  $4\frac{1}{2}$  miles east-north-eastward of Mys Dofinovskiy.

From the eastern end of the sandy beach the coast trends eastward and is high and reddish in appearance for about  $4\frac{1}{2}$  miles to Mys Sychavskiy

- ( $46^{\circ} 37' N.$ ,  $31^{\circ} 08' E.$ ); it is intersected about midway by two gullies and, about three-quarters of a mile westward of Mys Sychavskiy, by a  
25 wide valley in which the large village of Sychavka can be seen from seaward. The stretch of coast between this wide valley and Mys Sychavskiy resembles an equal-sided trapezium and is very prominent. A short distance westward of the point there is a triangular gap formed by the mouth of a steep-sided gully.

- 30 Several obstructions lie up to one mile offshore between Adzhalykskiy liman and Mys Sychavskiy.

Sychavskiy light is exhibited at an elevation of 157 feet (47m8) from a black framework pyramid, 46 feet (14m0) in height, situated about half a mile westward of Mys Sychavskiy.

- 35 A conical light-and-whistle buoy, fitted with a radar reflector and exhibiting a *red flashing* light, is moored on the northern side of the fairway of Voyenny farvater about 2 miles south-south-westward of Mys Sychavskiy. A 14-foot (4m3) patch lies about one mile southward of the point.

- 40 A green conical light-buoy, exhibiting a *green flashing* light, marks the northern side of a wreck with masts above water situated  $3\frac{1}{4}$  miles south-south-eastward of Mys Sychavskiy.

There are several shoal patches on the southern side of Voyenny farvater. A 29-foot (8m8) patch of sand and shells lies about  $1\frac{1}{2}$  miles

- 45 offshore and about  $3\frac{1}{4}$  miles east-south-eastward of Mys Dofinovskiy in the fairway; a 35-foot (10m7) patch lies half a mile south-eastward and a 23-foot (7m0) patch three-quarters of a mile south-eastward, of the 29-foot (8m8) patch.

A white light-buoy, fitted with a radar reflector and exhibiting a  
50 *white flashing* light every five seconds, is moored  $2\frac{3}{4}$  miles southward of Grigor'yevka light-structure, and marks the northern side of the 23-foot (7m0) patch.

An obstruction, with a depth of 17 feet (5m2) over it, lies about  $3\frac{1}{4}$  miles south-south-eastward of Grigor'yevka light-structure.

- 55 The northern side of Odesskaya banka extends northward into Voyenny farvater at about 5 miles south-westward, and  $3\frac{1}{4}$  miles south-south-

*Chart 2212.*

eastward, respectively, of Mys Sychavakiy; both of these extensions are marked by a spar buoy, painted white, fitted with a radar reflector and surmounted by a cone, point up.

**Eastern part of Voyenny farvater.—Coast.—Dangers.—Buoyage.**—From Mys Sychavskiy the coasts trends eastward for about  $4\frac{1}{2}$  miles to Mys Karabush ( $46^{\circ} 36' N.$ ,  $31^{\circ} 15' E.$ ). Between these points is a stretch of sand and marshy ground at the southern end of Tiligul'skiy liman which lake extends northward for about 26 miles. On each of the high sloping sides of the southern end of this lake, about  $2\frac{1}{2}$  miles inland, there is a village; Koblevo, the eastern village, has a small church, several windmills, and some tall trees, and when seen from a distance appears to be situated on the coast. The former Koblevo coastguard station, which is very prominent, stands on a cliff about three-quarters of a mile west-north-westward of Mys Karabush.

Mys Karabush is ill-defined except from eastward or westward; it rises in a precipitous cliff, cut by a gully, to an elevation of 133 feet (40m5). Eastward of this point the land slopes down gradually to a low valley in which is the village of Morskoye; two gullies open into this valley, and on the height between them there is a windmill.

Banka Trutayeva, which is rocky, extends, with depths of less than 18 feet (5m5), about one mile southward from Mys Karabush. On this bank there is a depth of 5 feet (1m5) about  $7\frac{1}{2}$  cables southward of this point. The southern extremity of Banka Trutayeva is marked by a light-buoy, fitted with a radar reflector, painted red and exhibiting a *red flashing light every three seconds*. During the winter months, the light-buoy is replaced by a spar buoy, surmounted by a cone point down.

An obstruction, with a depth of 33 feet (10m1) over it, lies about  $1\frac{1}{2}$  miles south-westward of Mys Karabush.

From the eastern side of the valley in which the village of Morskoye is situated the coast trends eastward and is high and dark in colour as far as Mys Adzhiyask which is a steep bluff point, rising to an elevation of 141 feet (43m0), about  $4\frac{1}{2}$  miles eastward of Mys Karabush. A prominent lattice tower stands on the point. A 10-foot (3m0) rocky patch lies half a mile south-south-westward of Mys Adzhiyask, and there is a 21-foot (6m4) patch nearly one mile south-south-eastward of the point.

A light-buoy, painted red and white in bands, fitted with a radar reflector and exhibiting a *red flashing light every two seconds*, marks the fairway through Voyenny farvater,  $1\frac{1}{2}$  miles south-south-westward of Mys Adzhiyask ( $46^{\circ} 36' N.$ ,  $31^{\circ} 21' E.$ ).

A detached shoal, with a least depth of 17 feet (5m2) over it, lies on the southern side of Voyenny farvater,  $3\frac{1}{2}$  miles south-south-westward of Mys Karabush.

The northern side of Odesskaya banka, with depths of 19 feet (5m8), extends to within  $2\frac{1}{2}$  miles south-westward of Mys Adzhiyas.

**Wrecks.—Buoy.**—Four wrecks lie in the south-western approach to Berezanskiy liman (page 230) and Dneprovskiy liman (page 231). The western of these wrecks over which there is a depth of 26 feet (7m9) lies  $1\frac{1}{2}$  miles south-south-westward of Mys Adzhiyask.

A wreck over which the depth is 26 feet (7m9), marked on its northern side by a green can buoy exhibiting a *green flashing light*, lies 2 miles southward of Mys Adzhiyask; two other wrecks with depths over them of 13 and 19 feet (4m0 and 5m8) lies about  $2\frac{1}{2}$  and  $2\frac{3}{4}$  miles south-south-eastward, respectively, of the same point.

**Light.**—Karabush light is exhibited, at an elevation of 133 feet (40m5),



**Chart 2212.**

from a square metal pyramid with a black framework top, 59 feet (18m0) in height, situated close east-north-eastward of Mys Karabush.

- Directions for Voyenny farvater.**—The recommended track for  
 5 vessels proceeding from Odesskiy port to Dneprovskiy liman follows the alignment of Vorontsovskiy light-structure with the light-structure 12 cables west-south-westward, bearing  $250\frac{1}{2}^{\circ}$  astern (pages 221 to 222), to the light-buoy 2 miles south-south-westward of Mys Sychavskiy ( $46^{\circ} 37' N.$ ,  $31^{\circ} 08' E.$ ) but see caution on page 221; thence a vessel should  
 10 steer eastward to the light-buoy  $1\frac{1}{2}$  miles south-south-westward of Mys Adzhivask, and thence east-south-eastward to the light-buoy marking the northern side of the entrance to the Bugsko-Dneprovsko-Limanskiy kanal (page 235).

**BEREZANSKIY LIMAN AND APPROACH.—Island and dangers.**

- 15 —**Navigational aids.**—Between Mys Adzhivask and Mys Adnsiyask ( $46^{\circ} 37' N.$ ,  $31^{\circ} 24' E.$ ) about  $2\frac{1}{2}$  miles east-north-eastward, there is a light, on the western side of which stands the large village of Rybakovka. Within the head of this light is Ozero Tuzlovskoye.

- Ostrov Berezan' lies on the western side of the approach to Berezanskiy  
 20 liman, with its southern extremity ( $46^{\circ} 35' N.$ ,  $31^{\circ} 24' E.$ ) about  $1\frac{1}{2}$  miles southward of Mys Adnsiyask. The coast of this island is steep and reddish in colour; its southern extremity is high, and from it, the island slopes down northward, terminating in a low point on which there is landing. See view [10]. The island is connected with Mys Adnsiyask by  
 25 a spit with depths of 2 feet (0m6) over it.

A light is exhibited, at an elevation of 103 feet (31m4) from a tower 37 feet (11m3) in height situated on Ostrov Berezan'.

- Prohibited anchorage.**—Anchoring and fishing are prohibited in an area, indicated on the chart, extending over the spit connecting Ostrov  
 30 Berezan' and the mainland north-north-westward of the north-western extremity of the island.

- Anchorage.**—Anchorage can be obtained, in depths of about 27 feet (8m2), south-eastward of the southern extremity of Ostrov Berezan'. Care must be taken to avoid anchoring in the prohibited  
 35 area described above and on page 237.

- Berezanskiy liman.**—**Navigational aids.**—Berezanskiy liman is entered between the eastern extremity of Berezanskaya kosa, about three-quarters of a mile north-eastward of Mys Adnsiyask, and the western extremity of Lagernaya kosa (Berezan spit), about 4 cables east-  
 40 north-eastward. Both of these spits are sandy and the former is low; Viktorovskiy front leading light-beacon, see page 235, stands about 9 cables eastward of the extremity of Lagernaya kosa. The entrance is approached through a channel over the flat fronting it, on which there are depths of 5 feet (1m5) except in autumn when, with northerly winds,  
 45 the depths are not more than  $4\frac{1}{2}$  feet (1m4). In 1954, there was a least depth of  $10\frac{1}{2}$  feet (3m2) in the entrance channel to Berezanskiy liman.

- The entrance to the channel across the flat is marked on its western side by a red and white conical buoy, and on its eastern side by a black and white conical buoy. The channel is marked on its eastern side by a  
 50 black spar buoy surmounted by two cones, bases together, moored about 4 cables south-westward of the eastern entrance point.

- Three pairs of leading beacons, situated westward and northward of the entrance, lead through the channel across the flat and into Berezanskiy liman; three more pairs lead into and through the narrows about  $4\frac{1}{2}$   
 55 miles within the entrance.

*Chart 2212.*

From its entrance, Berezenskiy liman extends about 14 miles north-north-eastward to its head, into which flows Reka Berezan'. About  $6\frac{1}{2}$  miles within the entrance a branch extends north-westward from its western side, forming Zaliv Sasitskiy, the estuary of Rechka Sasik. Both of these rivers dry in summer and are of little importance. 5

Beykushskiy liman opens into Berezenskiy liman on its eastern side, close within the entrance.

A ferry crosses Berezenskiy liman at the village of Kaze, which is situated on the western side about  $4\frac{1}{2}$  miles within the entrance, where the estuary narrows to a width of about half a mile. 10

There are numerous villages on the shores of the estuary but the only one visible from seaward is Viktorovka, which is situated in a ravine running in a northerly and southerly direction on the western side, about  $1\frac{1}{2}$  miles within the entrance. 15

For Viktorovskiye leading light-beacons, *see* page 235.

*Charts 2212, 2200, 2201.*

**DNEPROVSKIY LIMAN.—General remarks.**—Dneprovskiy liman (Kherson or Dnieper bay) is entered between the northern extremity of Kinburnskaya kosa ( $46^{\circ} 35' N.$ ,  $31^{\circ} 30' E.$ ) which lies about 4 miles east-south-eastward of the southern extremity of Ostrov Berezan', and Mys Ochakovskiy about 2 miles north-eastward. It is formed by the confluence of Reka Dnepr (Dnieper) and Reka Yuzhnyy Bug on which are situated the ports of Kherson and Nikolayev, respectively. 20

Kinburnskaya kosa (Kinburn peninsula) is the prolongation westward of the left bank of Reka Dnepr, and forms the southern shore of the estuary, terminating westward in a long, narrow point. It is low and sandy, and desolate in appearance, but in some places there are sandy hillocks, and, in others, small groves of trees and bushes; high rushes grow along almost the whole of this shore. 25

The northern shore of the estuary, for its whole length, has an almost even elevation of from 145 to 160 feet ( $44m2$  to  $48m8$ ); it consists of dark yellow or reddish clay bluffs, broken by a number of gullies and valleys. There are numerous villages along the whole of this shore. Almost in the centre of its length this shore is broken by the mouth of Reka Yuzhnyy Bug (Bugskiy liman). 30

Adzhigol'skaya kosa and Mys Stanislav extend southward from the general line of the northern shore about 10 and 25 miles, respectively, eastward of Mys Ochakovskiy. Opposite each of these two points there is a less pronounced extension from the southern shore; each of these is fringed by an extensive bank. These extensions divide the estuary into three basins. 40

The eastern shore of the estuary is formed by the marshy delta of Reka Dnepr, which is entirely covered with reeds and bushes, and, in many places, trees. This shore is fronted by a very shallow bank and is constantly changing: it is gradually extending into the estuary by the formation of new, and the extension of existing islands. 45

In the deeper parts of the estuary, and in Reka Yuzhnyy Bug, the nature of the bottom is soft mud, except where sandy ridges are forming across them. The shoals off the mouths of Reka Dnepr are composed of hard sand. 50

**Pilotage.**—Pilotage is compulsory, *see* Regulations below. There are pilot stations at the ports of Odessa (page 220), Kherson (page 243), and Nikolayev (page 251), and vessels proceeding to these ports should embark the pilot and the Customs guard off Vorontsovskiy light-structure, Odessa; 55

*Charts 2212, 2200, 2201.*

during the winter months a pilot look-out is also kept at Ochakov (page 236), and vessels should anchor  $2\frac{1}{2}$  miles eastward of the northern end of Ostrov Berezan' to embark the pilot.

- 5 A vessel bound for Kherson ( $46^{\circ} 37' N.$ ,  $32^{\circ} 36' E.$ ) requiring a port pilot, should so inform the Harbour-master at that port at least 6 hours before arrival.

Vessels proceeding from Kherson to Odessa should request a sea pilot 6 hours beforehand, and a port pilot 2 hours beforehand. The  
10 Captain of the Port, Odessa, should be informed by radio of the expected time of arrival off the breakwater at that port.

Vessels proceeding from Kherson which do not intend to call at Odessa should disembark the sea pilot in the outer roadstead at Odessa. *See* also pages 14, 15 and 231.

- 15 **Quarantine.**—*See* page 15. Health officials board vessels off Ochakov, and foreign vessels arriving from infected ports undergo quarantine here.

**Regulations.**—The following regulations apply to the Bugako-Dneprovsko-Limanskiy kanal:—

1. Pilotage is compulsory for all vessels, except those with a draught  
20 of 13 feet (4m0) and less, navigating between Odessa and Kherson.

2. The draught of vessels entering the channel is limited to the depth given in the latest U.S.S.R. Notices to Mariners, details of which should be ascertained from the pilot.

3. During the period of summer channel marking, navigation is permitted throughout the 24 hours; during the period of winter channel marking vessels drawing more than  $16\frac{1}{2}$  feet (5m0) are permitted to navigate  
25 the channel during the hours of daylight only.

4. Vessels of greater draught than  $16\frac{1}{2}$  feet (5m0) navigating the channel must display a black ball at the foremast head by day, or exhibit a *red*  
30 light at night.

5. Vessels with a draught of less than  $16\frac{1}{2}$  feet (5m0) must give way to those of greater draught.

6. Vessels passing one another on opposite courses must reduce speed to a minimum and exercise the greatest care, passing port side to port  
35 side, at the same time keeping to the starboard side of the channel.

7. Vessels passing dredgers in the channel must be navigated in accordance with the regulations for such vessels, *see* pages 15–16.

8. The speed of vessels in the channel with a draught greater than  $16\frac{1}{2}$  feet (5m0) must not exceed 10 knots; vessels of lesser draught may  
40 proceed at speeds of up to 12 knots.

9. All vessels using the channel are prohibited from anchoring in the channel or in the adjacent waters; but *see* paragraph 10.

10. Sea-going vessels navigating the channel in poor visibility, or with engines broken down, may anchor in the channel but must then signal  
45 to all vessels by radio that they are doing so, at the same time informing the harbourmasters at the ports of Nikolayev, Kherson, Ochakov and Odessa.

11. Deep draught vessels are prohibited from turning in the channel and proceeding on an opposite course.

12. Tugs in the channel are prohibited from towing more than two barges. The length of the tow when towing two barges must not exceed 66 feet (20m1); when towing one barge the tow must not exceed 164 feet (50m0).  
50

13. Vessels using the channel, or the inner roadstead of the Port of Kherson ( $46^{\circ} 37' N.$ ,  $32^{\circ} 36' E.$ ) are prohibited from throwing overboard  
55 slack, rubbish, or other waste material.

*Charts 2212, 2200, 2201.*

14. Vessels using the channel are prohibited from interfering with the buoyage and channel marking. In the event of damage to the channel buoyage or aids, vessels must inform the harbourmaster at the nearest port.

15. All fishing and other vessels are prohibited from fishing in the channel, anchoring, or making fast to the navigational marks.

16. Vessels proceeding to the Port of Kherson, after the issue of the notice concerning the closing of navigation, must proceed to that port only under the guidance of an ice-breaker; *see also pages 16–18.*

**Local Magnetic anomaly.—Caution.**—An area of local magnetic anomaly in which the variation may be affected between 5° W. to 9° E. lies in the approaches to Dneprovskiy liman; *see page 219.*

**Channels.—Depths.**—Dneprovskiy liman can be approached either northward of Odesskaya banka by Voyennyi farvater, described on page 227, and the first or Berezanskoye koleno (Berezan Ochakov channel) of Bugsko-Dneprovsko-Limanskiy kanal, or from south-westward, over the eastern part of Odesskaya banka. The latter route is practicable for a vessel drawing not more than 16 feet (4m9) but should not be attempted without local knowledge. Odesskaya banka can also be crossed in other places by a vessel with local knowledge.

For prohibited anchorage, *see page 230.*

*Charts 2212, 2200, 2232.*

Bugsko-Dneprovsko-Limanskiy kanal leads from a position about 1½ miles south-south-westward of the southern extremity of Ostrov Berezan' (46° 36' N., 31° 24' E.) through the entrance of Dneprovskiy liman and up that estuary and Reka Yuzhnyy Bug to the port of Nikolayev. It is divided into twelve reaches and has a total length of about 41 miles. It was dredged to a depth of 34 feet (10m4) in 1968.

*Charts 2212, 2200, 2201.*

A dredged channel, named Khersonskiy kanal, branches off from Bugsko-Dneprovsko-Limanskiy kanal abreast Adzhigol'skaya kosa, and leads through the central and eastern parts of Dneprovskiy liman into Reka Dnepr by Rvach girlo, and up Rvach branch of that river to Kherson. Khersonskiy kanal has a width of about one cable, and was dredged to 26 feet (7m9) in 1967.

**Water level.**—The water level in the estuary is highest from the middle of April to the middle of June, and lowest in the autumn. Fresh winds raise or lower the water level by as much as 1½ feet (0m5) above or below the mean level.

**Depth signals.**—Depth signals, *see page 21*, are displayed at Ochakov and Nikolayev (46° 58' N., 51° 58' E.).

**Current.**—During spring the current in the estuary sets outward at a rate not exceeding 2 knots, except in the narrow channels and in the mouth of the estuary, where it may attain a rate of 3 knots. After the middle of May the current begins to slacken, and during the summer its rate is not more than from one-quarter to three-quarters of a knot.

**Winds.—Fog.**—During winter north-easterly winds prevail in the estuary; in summer they are mainly southerly. Gales are most frequent in March, April and October, and are rare in July; they are usually northerly, but frequently north-westerly. Strong winds from almost any direction cause a confused sea in Dneprovskiy liman, but in Reka Yuzhnyy Bug the effect is slight.

Fog is most frequent from October to April; it is rare from May to August.

**Ice.**—Ice forms every year in Dneprovskiy liman and Reka Yuzhnyy

*Charts 2212, 2200, 2201.*

Bug, covering the shoal and fresh water areas. Only the mouths of the rivers freeze over completely; in the estuary itself the ice often breaks up and sometimes even disappears for short periods. In some winters  
 5 the shore is fringed with immovable ice as far as Odessa, but there are cases when there has been no ice in the open sea. In some years communication is established over the ice between places on the shores of the estuary and across Reka Yuzhnyy Bug between Voloshakaya kosa and Russkaya kosa.

10 From observations over a period of 26 years, ice first appeared in November 5 times, in December 15 times, in January 5 times, and in February once; from observations over a period of 21 years, it cleared in February 6 times, in March 14 times and in April once.

At Nikolayev ice first appears at the beginning of December, and  
 15 after a few days the river freezes over. In the course of the winter the ice in Reka Bug may occasionally break up or even clear completely. The ice begins to break up finally at the beginning of March and disappears about the middle or end of that month.

The mean maximum thickness of the ice off Ochakov, Kherson, and  
 20 Nikolayev is from 12 to 14 inches (0m3 to 0m35) but the ice occasionally attains a thickness of as much as 24 inches (0m6).

When Dneprovskiy liman and Reka Yuzhnyy Bug are frozen over, vessels are convoyed between the open sea and Nikolayev (46° 58' N., 51° 58' E.) by icebreakers. These icebreakers can be summoned by  
 25 telegraph or radio.

For conduct of icebreakers and signals between the icebreaker and the vessel being assisted, see pages 16-18. See also pages 27 to 28 and 32 to 36.

*Chart 2212.*

**ENTRANCE TO DNEPROVSKIY LIMAN. — Dangers. — Spoil-**  
 30 **ground. — Navigational aids.** — Mys Ochakovskiy (46° 36' N., 31° 33' E.) is low and sandy but rises, about half a mile northward, to a high bluff. There is a battery on the point above which is situated the town of Ochakov, which is visible from about 15 miles seaward.

Ochakovskaya otmel' extends about 1½ miles southward from Mys  
 35 Ochakovskiy, and thence about the same distance west-north-westward. There are depths of 7 to 18 feet (2m1 to 5m5) over this flat; its southern edge is steep-to.

Five obstructions lie on this flat, the positions of which may best be seen on the chart. The westernmost obstruction is marked by a light-spar-  
 40 buoy, surmounted by a cross and ball, and exhibits a *green flashing* light every five seconds. Two more obstructions lie about 1½ miles westward and 3 miles west-north-westward of Mys Ochakovskiy.

The northern extremity of Kinburnskaya kosa is low, narrow and subject to inundation. About one mile south-eastward of this point is  
 45 the disused Kinburnskaya battery. A narrow spit with depths of less than 6 feet (1m8) over it, extends about 8 cables north-westward from the northern extremity of Kinburnskaya kosa; it is very steep-to on its eastern side but its western side is shelving.

Kinburnskiy light (46° 34' N., 31° 30' E.) is exhibited, from a structure  
 50 5 cables south-south-eastward on the extremity of Kinburnskaya kosa.

The buoys marking Ochakovskaya otmel' and the spit extending north-north-westward from Kinburnskaya kosa are described with Bugsko-Dneprovsko-Limanskiy kanal on page 235.

In 1924, a sunken obstruction was reported in a position about 2½ miles  
 55 south-south-westward of Kinburnskiy light-structure. Two obstructions

*Chart 2212.*

lie about  $4\frac{1}{2}$  miles south-south-eastward and the same distance south-eastward of the same light-structure.

No. 1 spoil ground, indicated on the chart, lies about  $7\frac{1}{2}$  cables south-westward of Kinburnskiy light-structure.

Pervomayskiy ostrov (Fort Nikolaev), an artificial island on which there is a battery, is situated about  $1\frac{1}{2}$  miles southward of Mys Ochakovskiy ( $46^{\circ} 36' N.$ ,  $31^{\circ} 33' E.$ ).

Leading lights for the small basin comprising Ochakovskiy Trading harbour, *see* page 236, have been established north-westward of Mys Ochakovskiy. The front light is exhibited, at an elevation of 90 feet ( $27m4$ ), from a black, wooden, rectangular shield with a white vertical stripe, situated on the coast about 11 cables north-westward of Mys Ochakovskiy; the rear light is exhibited, at an elevation of 144 feet ( $43m9$ ), from a white, rectangular shield with a black vertical stripe, 37 feet ( $11m3$ ) in height, about 2 cables north-eastward of the front light. These lights in line, bearing  $052\frac{1}{2}^{\circ}$ , lead to Ochakovskiy Trading harbour.

**BUGSKO-DNEPROVSKO-LIMANSKIY KANAL.—First, second and third reaches.**—**Navigational aids.**—The first reach or Berezan-koye koleno (Berezan Ochakov channel) extends for about  $4\frac{1}{2}$  miles east-north-eastward from a position about  $1\frac{1}{2}$  miles south-south-westward of the southern extremity of Ostrov Berezan' ( $46^{\circ} 35' N.$ ,  $31^{\circ} 24' E.$ ).

A conical light-and-bell-buoy, painted red with a white band, fitted with a radar reflector and exhibiting a *red flashing light every two seconds*, is moored about  $1\frac{1}{2}$  miles south-south-westward of the southern extremity of Ostrov Berezan' and marks the northern side of the entrance to the first reach of the channel. Thence the channel is marked by buoys in accordance with the system described on pages 22 to 24.

Ochakovskiy leading lights have been established for the first reach. The front light is exhibited, at an elevation of 126 feet ( $38m4$ ), from a white, circular, stone tower, with a black vertical stripe and surmounted by a disc, 46 feet ( $14m0$ ) in height, situated about three-quarters of a mile north-westward of Mys Ochakovskiy; the rear light is exhibited, at an elevation of 162 feet ( $49m4$ ), from a similar tower, 52 feet ( $15m8$ ) in height, situated about half a mile east-north-eastward of the front light. These lights in line, bearing  $069^{\circ}$ , lead through the first reach.

A light-and-whistle-buoy, painted black with a white band, fitted with a radar reflector, and exhibiting a *white flashing light every one and a half seconds*, is moored on the southern side of the junction of the first and second reaches, about one mile north-westward of the north-western end of Kinburnskaya kosa.

The second reach or Viktoroskoye koleno (Ochakov channel) lies between Kinburnskaya kosa and the spit extending north-westward from it, and Ochakovskaya otmel'; it is very steep-to on its south-western side.

Viktorovskiye leading lights have been established for the second reach. The front light is exhibited, at an elevation of 61 feet ( $18m6$ ) from a white, square, metal framework tower with a white daymark, 18 feet ( $5m5$ ) in height, situated about 9 cables eastward of the western extremity of Lagernaya kosa ( $46^{\circ} 37' N.$ ,  $31^{\circ} 25' E.$ ) and prominent from its white appearance. A white house with a red tiled roof, and a small, grey, two-storeyed building, stand near the light-structure. The rear light is exhibited, at an elevation of 120 feet ( $36m6$ ), from a white, square, metal framework tower, with a white daymark, 32 feet ( $9m8$ ), situated on a hill near the village of Viktorovka (page 231), about  $2\frac{1}{2}$  miles north-

**Chart 2212.**

westward of the front light-structure. These lights in line, astern, bear  $314\frac{3}{4}^{\circ}$ .

- A red can light-buoy, exhibiting a *red flashing* light, is moored on the northern side of the junction of the second and third reaches, about 5 cables eastward of Kinburnskiy light-structure.

The third reach or Pervomayskoye koleno leads between the southern edge of Ochakovskaya otmel' and the flat extending northward from Kinburnskaya kosa which flat is shoaling.

- 10 Dneprovsko-Limanskiye leading lights have been established for the third reach. The front light is exhibited, at an elevation of 45 feet (13m7), from a white, circular, metal tower, 40 feet (12m2) in height, situated near the north-western extremity of Pervomayskiy ostrov; the rear light is exhibited, at an elevation of 79 feet (24m1), from a black metal frame-  
15 work turret, on a concrete base surmounted by a black rectangular day-mark with a white stripe down the centre, 69 feet (21m0), is situated about half a cable eastward of the front light-structure. These lights in line, astern, bear  $092\frac{1}{2}^{\circ}$ .

- A light-buoy, painted in red and white bands, fitted with a radar reflector, and exhibiting a *red flashing* light *every three seconds*, is moored on the northern side of the junction of the third and fourth reaches, about 5 cables westward of Dneprovsko-Limanskiye front light-structure.

- Caution**—Because of the shoaling of the flat northward from Kinburnskaya kosa, vessels with draught exceeding 26 feet (8m0) when turning from third into fourth reach must keep to the port side of the channel. Passing or overtaking in this section is prohibited (1968).

- Prohibited anchorage.**—Anchoring is prohibited within a distance of 4 cables northward, and  $5\frac{1}{2}$  cables southward of the line of Ochakovskiy leading lights of the first reach, between positions distant  $4\frac{1}{4}$  miles and 11 cables, from the front light; and from the latter position, within similar distances of Ochakovskiy Port leading line, to the shore. This area is not indicated on the chart.

- Directions.**—From the conical light-and-bell-buoy, painted red with a white band, situated on the northern side of the entrance of the first reach, vessels should pass between the spar buoys marking this reach, and steer for Ochakovskiy leading lights bearing  $069^{\circ}$ . When Viktorovskiy leading lights are in line, bearing  $314\frac{3}{4}^{\circ}$ , course should be altered sharply and the light-and-whistle-buoy on the southern side of the junction of the first and second reaches rounded, bringing these lights in  
40 line astern. When Dneprovsko-Limanskiye leading lights bear  $092\frac{1}{2}^{\circ}$ , course should be altered and the red can light-buoy marking the northern side of the junction of the second and third reaches should be rounded, and these leading lights steered for. For continuation of the dredged channel, *see* page 238.

- 45 **OCHAKOVSKIY TRADING HARBOUR.**—**Navigational aids.**—Ochakovskiy Trading harbour, situated about one mile north-westward of Mys Ochakovskiy ( $46^{\circ} 36' N.$ ,  $31^{\circ} 33' E.$ ) is only used by coastal shipping. The harbour consists of a small basin, with depths, in 1937, of  $16\frac{1}{2}$  feet (5m0), protected from south-eastward by a mole which extends about  
50 one cable westward from the coast and thence about half a cable north-westward. In 1937, there were depths of 14 feet (4m3) alongside the central part of the mole and of 8 feet (2m4), off its outer end. An approach channel, 262 feet (79m9) wide, and marked by spar buoys, leads to the entrance to the basin; in 1937, there were depths of  $16\frac{1}{2}$  feet (5m0) in the  
55 approach channel. For leading lights for this channel, *see* page 235.

*Chart 2212.*

A light is exhibited on the head of the above mole, at an elevation of 11 feet (3m4), from a post 5 feet (1m5) in height.

The remains of an old quay consisting of sunken piles, with depths of from 3 to 4 feet (0m9 to 1m2) over them, lie near the mole and are marked at either end by a spar buoy surmounted by a flag. 5

The Naval harbour at Ochakov is situated about one mile north-north-eastward of Mys Ochakovskiy. A pier, nearly 3 cables long, extends south-eastward from the shore here. A detached breakwater, about 1½ cables long, lies close off and across the head of the pier. Two short submerged breakwaters lie parallel with and about one cable off each side of the pier. 10

A light is exhibited from each end of the detached breakwater.

**Prohibited anchorage.**—**Anchorage.**—Anchoring and fishing are prohibited in an area, indicated on the chart, between Mys Ochakovskiy, Pervomayskiy ostrov (Fort Nikolaev), and Kinburnskaya battery. 15

Navigation is prohibited in an area, indicated on the chart, eastward, southward and westward of Pervomayskiy ostrov.

Vessels can obtain anchorage according to their draught either westward or eastward of Mys Ochakovskiy, clear of the prohibited anchorage area, and of the lines of the leading lights for the dredged channel. 20

**Town.**—**Life-saving.**—**Storm signals.**—**Depth signals.**—The town of Ochakov (46° 37' N., 31° 32' E.) is situated close within Mys Ochakovskiy, the most prominent landmark being the chimney of a brickworks about 1½ miles northward of the point. The chief exports are corn, salt and fish, and the principal import is coal. 25

A lifeboat is stationed about 4 cables north-north-eastward of Mys Ochakovskiy.

Storm signals, *see* page 18, and depth signals, *see* page 21, are displayed from a mast about three-quarters of a mile northward of Mys Ochakovskiy. 30

There is regular sea communication with Odessa, Kherson and Nikolayev.

*Charts 2212, 2200.*

**WESTERN PART OF DNEPROVSKIY LIMAN.**—**Dangers.**—

**Buoy.**—**Anchorage.**—From Mys Ochakovskiy the northern shore of the estuary extends north-eastward and thence east-south-eastward for about 12 miles to Adzhigol'skaya kosa. 35

This stretch is intersected by three ravines, and villages extend almost continuously along it.

Two conspicuous windmills stand on this stretch of coast: one, near the town of Kutsurub (46° 39' N., 31° 37' E.), is situated nearly 3½ miles north-eastward of Mys Ochakovskiy: the other, near the town of Pokrovka, is situated about 6 miles north-eastward of the same point. 40

Adzhigol'skaya kosa is low and sandy and lies at the mouth of the wide Adzhigol'skaya balka. The village of Malosolonchaki lies in this ravine and is only visible from southward. The coastal bank, (Adjigiol spit), with depths of 18 feet (5m5) and less, extends southward from Adzhigol'skaya kosa as far as the cutting of Bugsko-Dneprovsko-Liminskiy kanal. 45

From Kinburnskiy light-structure the southern shore of the estuary extends south-eastward, eastward and east-south-eastward for about 16½ miles to Prognoi. There are a number of villages along this stretch of coast. The village of Vasil'evka is situated about 4 miles west-north-westward of Prognoi. Between these two villages, large areas of kelp extend up to 1½ miles offshore. 50

The coastal bank, with depths of less than 18 feet (5m5), extends up to 55



*Charts 2212, 2200.*

2½ miles offshore about 8½ miles eastward of Kinburnskiy light-structure.

Spoil grounds Nos. 3 and 4, and a disused spoil ground, indicated on the chart, lie between the southern side of Adzhigol'skoye koleno and 5 Khersonskiy kanal, and the southern shore of the estuary.

There is a wharf at Prognoi. Small craft may anchor in depths of 2 to 5 feet (0m6 to 1m5) off the village. The channel leading to the wharf is described on page 239.

An obstruction lies about 2 cables west-north-westward of the wharf.

- 10 **BUGSKO-DNEPROVSKO-LIMANSKIY KANAL** (*continued from page 236*).—**Fourth and Fifth reaches.**—**Navigational aids.**—The fourth reach or Adzhigol'skoye koleno commences about 1½ miles southward of Mys Ochakovskiy (46° 36' N., 31° 33' E.) and runs between the south-eastern side of Ochakovskaya otmel' and Pervomayskiy ostrov in an east-north-easterly direction for about 2½ miles.

- Adzhigol'skiy leading lights have been established for the fourth reach. The front light is exhibited, at an elevation of 55 feet (16m8), from a grey rectangular concrete tower on a concrete base, 49 feet (14m9) in height, the side facing the leading line painted black with a white stripe, situated 4½ miles eastward of Mys Ochakovskiy; the middle light is 20 exhibited, at an elevation of 112 feet (34m1), from a red metal framework structure on a concrete base, 105 feet (32m0) in height, having a black square daymark with a white stripe, situated 2½ miles east-north-eastward of the front light; and the rear light is exhibited, at an elevation of 218 feet (66m5), from a red metal framework tower with a white rectangular daymark, 79 feet (24m1) in height, situated about 2½ miles east-north-eastward of the middle light, and 1½ miles north-westward of Adzhigol'skaya kosa. These lights in line bear 069°.

- A light is exhibited, at an elevation of 16 feet (4m9), from a red beacon, 30 situated about 2½ miles east-south-eastward of Mys Ochakovskiy, on the northern side of the dredged channel at the junction of the fourth and fifth reaches. An obstruction, consisting of the concrete base of a ruined beacon, over which there is a depth of 11 feet (3m4), stands close southward of the junction and is marked on its north-eastern side by a conical 35 light-buoy, painted in black and white bands and fitted with a radar reflector, exhibiting a *white flashing* light.

- The fifth reach or Ochakovskoye koleno runs in an easterly direction for about 8 miles to a position about one mile southward of Adzhigol'skaya kosa. Each of the light-buoys marking the fifth reach has a spar buoy of 40 appropriate colour moored close to it, and spar buoys are moored midway between each pair of light-buoys.

A light is exhibited, at an elevation of 20 feet (6m1), from a wreck lying on the southern side of the channel, about 6 miles eastward of Mys Ochakovskiy (46° 36' N., 31° 33' E.).

- 45 The fifth reach is also marked by two pairs of leading light-beacons forming an alignment for the navigation of the reach on a reciprocal bearing; the western pair is situated southward and south-eastward of Mys Ochakovskiy, and the eastern pair is situated south-eastward of Adzhigol'skaya kosa. The structures of each pair stand nearly two miles 50 apart, and all consist of grey metal framework towers standing on concrete bases and surmounted by black rectangular daymarks with a white stripe down the centre; the front structures of each pair are 42 feet (12m8) in height, and the rear structures are 94 feet (28m7) in height. The lights exhibited from the structures have an elevation of 43 feet (13m1) in the 55 case of each front structure, and of 95 feet (29m0) in the case of each rear

*Charts 2212, 2200.*

structure. These lights are in line on the bearings  $088^{\circ} 12'$ – $268^{\circ} 12'$ .

Leading light-beacons are situated on Adzhigol'skaya kosa. The front light is exhibited at an elevation of 12 feet (3m7) from a white rectangular stone tower, the side of which facing the leading line is painted black with a white central stripe, 22 feet (6m7) in height, situated about  $1\frac{1}{2}$  cables north-westward of Adzhigol'skaya kosa; the rear light is exhibited at an elevation of 23 feet (7m0) from a similar structure, 29 feet (8m8) in height, situated about one cable northward of the front light-structure.

These light-beacons in line, bearing  $350^{\circ}$ , indicate the junction of the fifth and sixth reaches of Bugsko-Dneprovsko-Limanskiy kanal. The lights are exhibited in winter when the light-buoys are removed; in summer, they are exhibited only when required. The northern of the two light-buoys marking the junction of the fifth and sixth reaches is a light-and-bell-buoy, fitted with a radar reflector.

**Directions** (*continued from page 236*).—When Adzhigol'skiy leading lights bear  $069^{\circ}$ , the red and white light-buoy marking the northern side of the junction of the third and fourth reaches should be rounded, and these leading lights steered for, passing between the spar-buoys marking this reach. See caution on page 236. Thence course should be altered eastward, passing between the light-beacon, on the northern side of the dredged channel and the light-buoy marking the obstruction on the southern side, at the junction of the fourth and fifth reaches, bringing the western fifth reach light-structures, referred to above, in line astern bearing  $268\frac{1}{2}^{\circ}$  which leads down the fifth reach between the lines of buoys marking it. When the eastern fifth reach light-structures can be distinguished ahead they should be steered for, in line, bearing  $088\frac{1}{2}^{\circ}$ . About one mile southward of Adzhigol'skaya kosa, and when the light-beacons on that point are in line, bearing  $350^{\circ}$ , the channel divides, the north-eastern branch leading to the entrance of Reka Yuzhnyy Bug, and the south-eastern branch towards Kherson. For continuation of directions to Nikolayev, see page 249, and to Kherson, see page 242.

**PROGNOI APPROACH CHANNEL.**—**Navigational aids.**—A channel with a least depth of 7 feet (2m1), with two reaches, leads into the bight north-westward of the village of Prognoi ( $46^{\circ} 30' N.$ ,  $31^{\circ} 53' E.$ ). The outer of these reaches commences close eastward of the first pair of spar buoys marking Khersonskiy kanal and runs on the line of Kapustinskiye leading beacons for about  $2\frac{1}{2}$  miles, thence the inner reach runs south-eastward on the line of Prognoyskiye leading beacons.

Kapustinskiye leading beacons are situated on the low, shelving coast about  $2\frac{1}{2}$  miles westward of the village of Prognoi, and consist of two black spars with wooden stays, 38 feet (11m6) in height, surmounted by triangles, that on the front beacon being point down, and that on the rear, point up.

Prognoyskiye leading beacons consist of two beacons similar to Kapustinskiye leading beacons and are situated in the village of Prognoi.

**Directions.**—Vessels proceeding to the bight off the village of Prognoi should follow the directions for Bugsko-Dneprovsko-Limanskiy kanal until Kapustinskiye leading beacons are in line, bearing  $174\frac{1}{2}^{\circ}$ , when they should be steered for. When nearing the turn into the inner reach, vessels should keep strictly to the above leading line until Prognoyskiye leading beacons are in line bearing  $130\frac{1}{2}^{\circ}$ , when they should be steered for on that bearing and anchorage obtained off the village of Prognoi as convenient.

*Charts 2212, 2200, 2201.*

**EASTERN PART OF DNEPROVSKIY LIMAN.—Dangers.**—On the northern side of the estuary between Mys Bublikova ( $46^{\circ} 36' N.$ ,  $32^{\circ} 03' E.$ ) and Mys Stanislav, about 5 miles south-eastward, there is  
5 a light on the northern side of which, in the mouth of a deep valley, lies the village of Aleksandrovka.

Mys Stanislav rises to high land, but terminates southward in a sandy point on which are a number of windmills which are the first buildings seen when approaching from north-westward. The large village of  
10 Stanislav is situated partly on the sandy point and partly on the high land within it.

A coastal bank, with depths of less than 6 feet (1m8), extends as much as  $1\frac{1}{2}$  miles southward from Mys Bublikova and about one mile south-westward from Mys Stanislav.

15 Ostrov Verbki and Ostrov Yanushev lie close off the southern side of the estuary, about  $3\frac{1}{2}$  miles south-south-westward and about the same distance southward, respectively, of Mys Stanislav. The latter islet can be identified by some trees on it.

The coastal bank, with depths of less than 6 feet (1m8), extends about  
20 one mile offshore between Prognoi (page 239) and Ostrov Verbki, and about  $1\frac{1}{2}$  miles north-eastward from this islet. The outer edge of the bank northward of Ostrov Verbki is steep-to.

From Mys Stanislav the northern side of the estuary trends east-north-eastward for about 5 miles and thence south-eastward for about  
25  $3\frac{1}{2}$  miles to Mys Kizim, on the northern side of the delta of Reka Dnepr. This stretch of coast is high and of clay formation, and is intersected by several gullies, in the westernmost of which, about  $2\frac{1}{2}$  miles east-north-eastward of Mys Stanislav, are the villages of Shirokaya Balka and Glubokaya Pristan', and in the next, about  $2\frac{1}{2}$  miles farther east-north-eastward, is the village of Sofiyevka; all these villages are prominent.  
30 A church in the village of Kizomys (Kasperovka), about  $1\frac{1}{2}$  miles east-north-eastward of Mys Kizim, is a good landmark, and the trees covering the islands of the delta of Reka Dnepr, are prominent.

Mys Kizim ( $46^{\circ} 33' N.$ ,  $32^{\circ} 19' E.$ ) is low and sandy but rises steeply  
35 to high land a short distance northward.

From abreast Ostrov Yanushev, the southern side of the estuary trends east-south-eastward for about 6 miles to the entrance of Zbur'yevskiy zaliv, which lies on the southern side of the delta of Reka Dnepr.

*Charts 2200, 2201.*

40 **KHERSONSKIY KANAL.—First, Second and Third reaches.—Depths.—Navigational aids.—Anchorage.**—Kherson approach channel, known as Khersonskiy kanal branches off Bugsko-Dneprovsko-Limanskiy kanal at the junction of its fifth and sixth reaches (page 239) southward of Adzhigol'skaya kosa; between its entrance and the entrance  
45 to the Rvach branch of the delta of Reka Dnepr, the channel is marked by spar buoys and light-and-bell-buoys in accordance with the systems described on pages 22-24; all the light-and-bell-buoys on the southern side of the dredged channel are fitted with radar reflectors.

Khersonskiy kanal was dredged to a depth of 27 feet (8m3) in 1968.  
50 The width of the first and second reaches is 328 feet (100m0) and of the third reach, 262 feet (80m0).

Two obstructions lie in the dredged channel about 5 miles south-westward and  $4\frac{1}{2}$  miles southward, respectively, of Mys Bublikova ( $46^{\circ} 36' N.$ ,  $32^{\circ} 03' E.$ ).

55 The first reach of Khersonskiy kanal runs east-south-eastward from its entrance for  $12\frac{1}{2}$  miles to Verbchanskiy leading lights.

*Charts 2200, 2201.*

It is marked by spar buoys and light buoys. On the northern side of this reach are light-buoys Nos. 10 to 18; on the southern side Nos. 9 to 17. The turning point from the first to second reaches is marked by light-buoys Nos. 7 and 8.

Stanislav-Adzhigol'skiy leading light-beacons have been established for the first reach of Khersonskiy kanal. The front light is exhibited, at an elevation of 79 feet (24m1), from a dark red, metal framework tower, on a rubble foundation, 79 feet (24m1) in height, situated on a shoal off the northern end of Ostrov Yanushev; the rear light is exhibited, at an elevation of 221 feet (67m4), from a similar tower, 211 feet (64m3) in height, situated about  $3\frac{1}{2}$  miles east-south-eastward of the front light. These light-beacons in line, bear  $109^{\circ}$ . Owing to shoaling, vessels should keep strictly on the leading line. These beacons are lighted in winter when the light-buoys marking the channel are withdrawn.

*Chart 2201.*

Verbchanskiye leading lights are established to indicate the junction of the  $109^{\circ}$  alignment of the Kherson approach channel with the  $076^{\circ}$  alignment of the Kasperovskiye leading light-structures, referred to below. The front light is exhibited at an elevation of 35 feet (10m7) from a mast with a black diamond daymark, 35 feet (10m7) in height, situated on the mainland shore 2 cables southward of Ostrov Verbki ( $46^{\circ} 29' N.$ ,  $32^{\circ} 05' E.$ ), the rear light is exhibited at an elevation of 46 feet (14m0) from a similar structure, 49 feet (14m9) in height, 2 cables southward of the front light-structure; in line these lights bear  $181\frac{1}{2}^{\circ}$ .

Nos. 1 and 2 anchorage areas have been established in the vicinity of the channel junction referred to above; vessels which may require to anchor in these areas should obtain information concerning it from the pilot.

The second reach of Khersonskiy kanal begins  $2\frac{1}{2}$  miles south-westward of Mys Stanislav and extends east-north-eastward for 8 miles.

The northern side of the channel is marked by Nos. 6, 4a, and 4 light-and-bell-buoys; the southern side is marked by Nos. 5, 3a, and 3 light-and-bell-buoys. Nos. 2 and 1 light-and-bell-buoys mark the turning point from the second to the third reaches.

A submerged wreck, marked by a green conical buoy lies near the dredged channel in the vicinity of No. 5 light-and-bell-buoy. The leading line must be strictly adhered to in the vicinity of this wreck.

Kasperovskiye leading lights have been established for the second reach. The front light is exhibited, at an elevation of 46 feet (14m0), from a white, stone building, 10 feet (3m0) in height, surmounted by a white, rectangular daymark, situated about three-quarters of a mile north-north-westward of Mys Kizim ( $46^{\circ} 33' N.$ ,  $32^{\circ} 19' E.$ ); the rear light is exhibited, at an elevation of 114 feet (34m7), from a dark red, square, stone tower, 71 feet (21m6) in height, situated about 8 cables east-north-eastward of the front light and near the village of Kizomys. These lights in line bear  $076^{\circ}$ .

The third reach of Khersonskiy kanal begins 6 miles eastward of Mys Stanislav and extends eastward for 6 cables to the entrance to Reka Rvach ( $46^{\circ} 33' N.$ ,  $32^{\circ} 18' E.$ ).

Malyy Kasperovskiye leading lights are established for the third reach and lead to the Rvach branch of the delta; *see* below. The front light is exhibited at an elevation of 37 feet (11m3) from a black rectangular daymark surmounted by a black diamond topmark, both with a white stripe, 38 feet (11m6) in height, situated about 5 cables north-westward of Mys Kizim; the rear light is exhibited at an elevation of 56 feet (17m1) from a similar structure 62 feet (18m9) in height, situated  $2\frac{1}{2}$  cables east-south-

*Chart 2201.*

eastward of the front light-structure; in line, these lights bear  $096^{\circ} 48'$ .

Within Rvach girlo, the channel is marked by lights and beacons.

- Directions** (*continued from page 239*).—From the eastern end of the fifth reach of Bugsko-Dneprovsko-Limanskiy kanal, southward of Adzhigol'skaya kosa, vessels should keep Stanislav-Adzhigol'skiy leading beacons in line, bearing  $109^{\circ}$ , passing between the buoys marking the dredged channel. When Verbchanskiye light-bacons come into line bearing  $181\frac{1}{2}^{\circ}$ , Kasperovskiye leading lights should be brought and kept in line, bearing  $076^{\circ}$ , which will lead through the second reach; thence the Malyy Kasperovskiye leading lights should be kept in line, bearing  $096\frac{3}{4}^{\circ}$ , which leads between the training walls at Rvach girlo, whence vessels should follow the buoyed channel to Kherson; *see* below.

- REKA DNEPR.—General remarks.**—Reka Dnepr (Dnieper) rises at an elevation of 830 feet (253m0) in the marshes of the province of Smolensk and is about 1,200 miles in length. It flows through thickly populated country and is of considerable importance since the construction of Dneprovskiy Power dam and the canalization of the river round it, by which the river can now be navigated above the rapids. The upper waters of the river are connected with the Polish River Bug and thus with the Baltic, *see* page 6.

- About  $2\frac{1}{2}$  miles below Kherson, which lies about 13 miles east-north-eastward of Mys Kizim ( $46^{\circ} 33' N.$ ,  $32^{\circ} 19' E.$ ), the river divides into Ol' Khovyy Dnepr and Staryy Dnepr, two channels which are later separated into many interlacing streams forming a large marshy delta, through which the river discharges by nine mouths, called "girla", of which only Rvach girlo, formed by two training walls, will admit sea-going vessels.

- Zbur'yevskoye girlo (Zburevka entrance), the southernmost of these mouths, is formed by the junction of Reka Bakay (Bakai) and Reka Konka, and lies on the northern side of Zbur'yevskiy zaliv. In 1909, a channel, dredged to a depth of  $9\frac{1}{2}$  feet (2m9), joined the fairway channels of Reka Bakay and Reka Konka, with depths of 12 feet (3m7) in the estuary. In 1937, this channel, which is not buoyed, had silted to a depth of 7 feet (2m1).

Owing to the canalization of the river and the construction of locks at Zaporozh'ye, about 200 miles above Kherson, the water level in the river is kept practically constant, although the water level in the lower reaches may occasionally be raised by wind action.

- Buoyage and beacons.—Caution.**—The bends of Rvach kanal in the river are marked by light-buoys and lights on wooden posts on the river banks, and the fairway is marked by spar buoys and small wooden buoys. These lights and buoys are coloured in accordance with the systems in use in the estuary, *see* pages 22–24.

- The spar buoys are liable to be submerged by strong currents.

**Current.**—At Kherson, the current usually sets at a rate of from half a knot to 2 knots, but, during floods, it may attain a rate of from 4 to 5 knots, rendering navigation dangerous. In spring, the current tends to wash away the banks, and frequently causes shoaling in places.

- KHERSON.—General remarks.**—The city of Kherson ( $46^{\circ} 37' N.$ ,  $32^{\circ} 36' E.$ ) which, in 1967, had a population of 222,000, is situated on the northern bank of Reka Koshevaya, at its junction with Reka Dnepr. It is the centre of local government, an important trading centre and one of the three largest ports in the Black sea. The climate is healthy. On

*Chart 2201.*

Karantinnyy ostrov, which forms the southern bank of Reka Koshevaya southward of the town, are some slips and workshops. The principal exports are timber and grain.

Khersonskiy reydy includes that area abreast the town and Karantinnyy ostrov and extends nearly to Ostrov Malyy Potemkin, a small, island situated in the Rvach branch, about 2 miles south-westward of the town. This roadstead is from 2 to 4 cables wide, with depths, fronting the town, of from 30 to 40 feet (9m1 to 12m2).

**Quays.**—The northern bank of Reka Dnepr, for about 6 cables north-eastward forms its junction with Reka Koshevaya, is fronted by quays, with depths, in 1967, of about 24 feet (7m3) alongside, for berthing the deeper draught vessels. Above the quays is a pier which is used by the port workshops.

The port quarter and a pier, which is used by vessels plying to Odessa, lie at the entrance of Reka Koshevaya. All the remaining piers are situated in this branch and are used by local and up-river traffic.

Vessels are berthed at the quays and piers, or secure to buoys moored in the roadstead.

Two cambers, for the use of vessels awaiting transshipment of cargo, have been constructed on the southern bank of Reka Dnepr eastward of the quays; each of these cambers has a depth of 14 feet (4m3).

**Prohibited anchorage.**—Anchorage is prohibited in an area extending south-eastward across Reka Dnepr between positions 8 and 19 cables north-eastward of the junction of Reka Dnepr and Reka Koshevaya.

**Pilots.**—See pages 14, 15, 220, 231.

**Quarantine.**—See page 15.

**Port regulations.**—See page 15.

It is forbidden to dispose of ashes and rubbish by throwing them overboard; they must be taken on shore and stowed in places indicated by the Port Authorities.

**Port facilities.**—Stocks of coal and fuel oil are maintained.

Small repairs can be carried out. There are sixteen cranes of 3 to 10 tons lifting capacity on the quays, and three floating cranes, the largest of which is of 100 tons lifting capacity. There are two floating docks; for details of the larger, see Appendix I.

The city and two of the quays are connected with the general railway system.

Fresh provisions can always be obtained in sufficient quantities. Fresh water is laid on to the quays. Water may also be obtained from the river but it should be boiled before drinking.

**Communications.—Radio station.**—During the period of navigation, there is regular sea communication with Odessa, Ochakov, Nikolayev and various towns on Reka Dnepr.

There is a radio station at Kherson, see page 26.

**Storm signals.**—Storm signals, see page 18, are displayed from a mast situated near the harbour master's office at the entrance to Reka Koshevaya.

**Ice.**—See pages 27–28 and 32–36.

*Charts 2200, 2232.*

**REKA YUZHNYI BUG.—General remarks.**—The entrance to Reka Yyzhnyy Bug lies between Adzhigol'skaya kosa (46° 36' N., 31° 47' E.) described on page 237 and Mys Bublikova described on page 240, about 11 miles eastward; the important city of Nikolayev (46° 58' N., 32° 00' E.) is situated on its eastern bank about 21 miles above its entrance. The

*Charts 2200, 2232.*

river is winding and from about one to 3 miles wide; it banks are bordered by sand flats, especially on its eastern side, from which, in some places, they extend beyond the middle of the river.

- 5 The western bank is almost everywhere composed of clay, and is high and steep; the eastern, on the contrary, consists of gently undulating hills with low tongues of sand.

- The channel generally follows the western bank except southward of Voloshskaya kosa and Russkaya kosa, where it lies in mid-river, and near the remains of Konstantinovskaya battery, about 2 miles southward of Nikolayev, where it lies near the eastern bank. In 1960, the maximum draught permitted for vessels proceeding to, or from Nikolayev, was 26 feet (7m9), the channel being dredged to 28 feet (8m5).

- The river is navigable for small craft as far as Vosnesensk, about 15 40 miles above Nikolayev.

**Water level.**—The water level in the river is highest from the middle of April to the middle of June, and lowest in the autumn, after the middle of September. Fresh winds raise or lower the water level by as much as 3 feet (0m9) above or below the mean level.

- 20 **Current.**—Normally, the current in the river depends on the direction of the wind in Dneprovskiy liman and its entrance. A constant current is caused by the melting of the ice in the upper reaches in the spring, but it does not last long and its rate is inconsiderable. Off Nikolayev, from April to October, there is an almost regular diurnal change, the current 25 setting down stream in the morning and upstream in the evening.

**Ice.**—See pages 27-28 and 32-36.

- ADZHIGOL'SKAYA KOSA TO RUSSKAYA KOSA.—Coast.**—From Adzhigol'skaya kosa the western shore of Reka Yuzhnyy Bug extends east-north-eastward for about  $3\frac{1}{2}$  miles to Mys Sary-Kamysh ( $46^{\circ} 38' N.$ , 30  $31^{\circ} 52' E.$ ) and is high. Dneprovskoye village stands on the edge of the cliff about 5 cables westward of Mys Sary-Kamysh.

- From Mys Sary-Kamysh, the western shore extends north-eastward for about  $1\frac{1}{2}$  miles to Mys Saken and continues high with steep cliffs which, about midway along this stretch, are broken by the deep Krestovyy 35 ovrag.

The coastal bank, with depths of less than 18 feet (5m5), extends up to 7 cables offshore between Adzhigol'skaya kosa and Mys Saken, and there are several 3-foot (0m9) patches close within its outer edge.

- From Mys Saken the western shore trends northward for about  $4\frac{1}{2}$  miles 40 to Voloshskaya kosa and is high and intersected by several gullies, the most prominent of which are Ol'viyskaya balka and Parutinskaya balka.

- Ol'viyskaya balka can be identified by a farmhouse and orchard near its mouth, about  $1\frac{1}{2}$  miles northward of Mys Saken, and Parutinskaya balka, by the large village of Parutino, which, with several windmills, is 45 situated on both sides of the gully, about  $1\frac{1}{2}$  miles farther northward.

Parutinskaya tower, a round, yellow tower on a wide octagonal base, 41 feet (12m5) in height, stands near the shore at an elevation of 180 feet (54m9), about  $2\frac{1}{2}$  miles northward of Mys Saken.

- Voloshskaya kosa is low and sandy and projects about half a mile 50 east-north-eastward from the general line of the coast.

No. 6 spoil ground lies parallel with and about 5 cables offshore of this stretch of coast.

- The coastal bank, with depths of less than 18 feet (5m5), extends from about 3 to 9 cables offshore between Mys Saken and Voloshskaya 55 kosa.

*Chart 2232.*

From Mys Bublikova ( $46^{\circ} 36' N.$ ,  $32^{\circ} 03' E.$ ) the eastern shore of the river trends north-westward for about 4 miles to Mys Khablov about half a mile south-eastward of which point is Balka Pavlyutina. From Mys Khablov, which is not well-defined, the shore trends north-north-westward for about  $1\frac{1}{2}$  miles to Mys Semenov Rog, which is small and bluff. 5

Former spoil ground No. 5, with a width of about one mile, the north-western extremity of which lies about  $1\frac{1}{2}$  miles south-westward of Khablovskiy front leading light, *see* below, extends south-eastward for nearly  $3\frac{1}{2}$  miles. 10

Between Mys Semenov Rog and Russkaya kosa, a low point about 4 miles north-north-westward, the shore at first is steep with clay cliffs intersected by numerous gullies, but becomes gradually lower towards Russkaya kosa. Lupareva balka and Yefimovka balka, each with a village of corresponding name, lie about three-quarters of a mile, and  $1\frac{1}{2}$  miles, respectively, northward of Mys Semenov Rog. Kislyakovka balka, in which is a large village of the same name, with a church, lies about one mile north-westward of the mouth of Yefimovka balka. 15

Getmanova balka, on both sides of which stands the village of Russkaya, lies about  $1\frac{1}{2}$  miles south-eastward of the extremity of Russkaya kosa. 20

A bank, with depths of less than 18 feet (5m5), fronts the shore between Mys Semenov Rog and Russkaya kosa and extends as much as 8 cables westward from the former point. A narrow flat, on which the depths are less than 6 feet (1m8), extends about 8 cables south-westward from Russkaya kosa; its edge is steep-to. 25

**BUGSKO-DNEPROVSKO-LIMANSKIY KANAL** (*continued from page 239*).—**Sixth to Eighth reaches.**—**Navigational aids.**—Leading lights for Khablovskoye Koleno, or the sixth reach, have been established on the eastern shore. Khablovskiy front light is exhibited, at an elevation of 111 feet (33m8), from a black, rectangular shield with a white stripe, surmounted by a triangle, point up, situated on the shore near Mys Khablov; the rear light is exhibited, at an elevation of 190 feet (57m9), from a black, rectangular shield with a red vertical stripe, surmounted by a triangle, point up, situated about 2 miles east-north-eastward of the front leading light-structure. 30 35

Sary-Kamyshkiye light-beacons are situated at the edge of the cliff, about 5 cables north-north-eastward of Mys Sary-Kamysh. The front beacon ( $46^{\circ} 38' N.$ ,  $31^{\circ} 53' E.$ ) consists of a black, rectangular framework structure with a white vertical stripe, surmounted by a triangle, point up, 20 feet (6m1) in height; the rear beacon, is similar but is surmounted by a triangle, point down, and is 46 feet (14m0) in height. These light-beacons in line, bearing  $326\frac{1}{2}^{\circ}$ , indicate the junction of the sixth and seventh reaches of the dredged channel. The northern light-buoy marking the junction of the sixth and seventh reaches is fitted with a radar reflector. 40 45

Leading lights for Luparevskoye koleno, the seventh reach, have been established on the eastern shore. Luparevskiy light, the front light is exhibited, at an elevation of 71 feet (23m2), from a black, rectangular, framework structure with a white vertical stripe, surmounted by a triangle, 44 feet (13m4) in height, situated about 4 cables northward of Mys Semenov Rog; Kislyakovskiy light, the rear light, is exhibited, at an elevation of 188 feet (57m3), from a black, rectangular, framework structure, with a red vertical stripe, 41 feet (12m5) in height, situated near a dwelling on a hill about  $3\frac{1}{2}$  miles north-eastward of the front light-structure. 50 55



*Chart 2232.*

Sakenskiye light-beacons are situated on the southern slope of a gully close northward of Mys Saken. The front beacon consists of a black, rectangular shield with a white vertical stripe, surmounted by a triangle, point down, 20 feet (6m1) in height; the rear beacon is similar but is surmounted by a triangle, point up, and is 26 feet (7m9) in height. These light-beacons in line, bearing  $290\frac{1}{2}^{\circ}$ , indicate the junction of the seventh and eighth reaches of the dredged channel. The western light-buoy marking the junction of the seventh and eighth reaches is fitted with a radar reflector.

Leading lights for Russkoye koleno, the eighth reach, have been established on the east bank. Svyatotroitskiy light, the front light ( $46^{\circ} 45' N.$ ,  $31^{\circ} 57' E.$ ), is exhibited, at an elevation of 55 feet (16m8), from a black, rectangular structure with a white vertical stripe, surmounted by a triangle, 47 feet (14m3) in height, situated about 2 cables within the extremity of Russkaya kosa; Ozharskiy light, the rear light, is exhibited, at an elevation of 68 feet (20m7), from a red wooden structure surmounted by a triangle, 72 feet (21m9) in height, situated on Ozharskaya kosa, about 2 miles northward of the front light. The western light-buoy marking the junction of the eighth and ninth reaches is fitted with a radar reflector.

**Buoyage.**—The dredged channel is marked by spar buoys and light buoys in accordance with the systems described on pages 22–24. Some buoys, outside the dredged channel, mark the outer edges of the shore banks.

**RUSSKAYA KOSA TO MYS MALAYA KORENIKHA.—Coast.—**

**Navigational aids.**—From Voloshskaya kosa the western shore trends in a curve north-westward, northward, and north-eastward, to the mouth of Bogdanovskaya balka, which is situated about  $6\frac{1}{2}$  miles northward of that point; the village of Staraya Bogdanovka stands at the mouth of the valley. This stretch of coast is high and intersected by several gullies. The mouth of Kotel'naya balka lies about  $3\frac{1}{2}$  miles north-westward of Voloshskaya kosa, and that of Kozyrskaya balka, about  $2\frac{1}{2}$  miles farther northward. In each of these gullies there is a village of the same name.

The whole of this stretch of coast is steep-to, the coastal bank, with depths of less than 18 feet (5m5), nowhere extending more than 3 cables offshore.

A beacon, consisting of a black, iron column with supports, surmounted by a ball, and 30 feet (9m1) in height, stands on the shore about a quarter of a mile south-south-westward of the mouth of Bogdanovskaya balka.

From Russkaya kosa the eastern shore trends northward for about  $2\frac{1}{2}$  miles to Ozharskaya kosa, a low, broad point, and thence a further  $2\frac{1}{2}$  miles north-north-eastward to Krivaya kosa, a small, narrow point which is also low and sandy. The whole of this stretch is sandy and shelving and the only prominent feature is the village of Galitsinovka, about one mile north-eastward of Ozharskaya kosa. The coastal bank, with depths of less than 18 feet (5m5), extends into the river as much as  $1\frac{1}{2}$  miles westward of Ozharskaya kosa, and has depths of only 6 feet (1m8) close within its outer edge, which is steep-to.

From the mouth of Bogdanovskaya balka the western shore trends north-eastward for about 3 miles to the mouth of a small gully in which is situated the village of Novaya Bogdanovka, and thence north-north-eastward for about  $3\frac{1}{2}$  miles to Mys Malaya Korenikha ( $46^{\circ} 56' N.$ ,  $31^{\circ}$

*Chart 2232.*

59' E.), a high, bluff, and rounded point on which is the village of Malaya Korenikha. The mouth of Balka Vonyuchiy Yar lies about three-quarters of a mile south-westward of Novaya Bogdanovka.

Between the mouth of Bogdanovskaya balka and the village of Novaya Bogdanovka, the shore is steep-to, but about one mile north-north-eastward of the latter village, the coastal bank, with depths of less than 18 feet (5m5), extends progressively farther offshore and, abreast a position about three-quarters of a mile south-south-eastward of Mys Malaya Korenikha, it extends about  $1\frac{1}{4}$  miles eastward. The remains of Konstantinovskaya battery are situated on this bank and are connected with the western shore by a causeway. A sunken groyne, composed of piles, extends eastward from these remains into the river, leaving only a narrow channel about one cable wide between its extremity and the eastern shore near Konstantinovskiy lighthouse, *see* below. Northward of the remains of Konstantinovskaya battery, the outer edge of the bank trends north-westward for about  $1\frac{1}{4}$  miles, at a distance of about one mile from the shore, and then curves westward towards Mys Malaya Korenikha; the edge of this part of the bank is steep-to.

From Krivaya kosa the eastern shore trends north-eastward for about  $4\frac{1}{4}$  miles to Siversova kosa, a small point on which is Siversovy lighthouse, and thence north-north-eastward for about  $1\frac{1}{4}$  miles to a slight projection on which is Konstantinovskiy lighthouse. Balabanovskaya kosa, a narrow point which may be identified by the village of Balabanovka, about one mile east-south-eastward, of it, lies about  $2\frac{1}{4}$  miles north-eastward of Krivaya kosa. The large village of Oktyabr'skoy, in which there are two churches and a group of windmills, stand on the eastern shore about midway between Balabanovskaya kosa and Siversova kosa, and about  $1\frac{1}{4}$  miles north-eastward of the latter point is the village of Shirokaya, which lies in a wide valley of the same name. The coastal bank, with depths of less than 18 feet (5m5), extends about half a mile offshore between Krivaya kosa and Siversova kosa, and about one cable offshore between the latter point and Konstantinovskiy lighthouse.

Konstantinovskiy light is exhibited, at an elevation of 36 feet (11m0), from a red, wooden framework pyramid, surmounted by a ball, 36 feet (11m0) in height, situated on the eastern shore about  $1\frac{1}{4}$  miles north-north-eastward of Siversova kosa, and about one cable eastward of the remains of Konstantinovskaya battery, *see* above.

From Konstantinovskiy lighthouse ( $46^{\circ} 55' N.$ ,  $32^{\circ} 01' E.$ ), the eastern shore trends northward for about  $1\frac{1}{4}$  miles to the mouth of Popova balka, whence it turns westward for about  $1\frac{1}{4}$  miles to the root of Kabotazhnyy mol, a curved mole which shelters the commercial port of Nikolayev, northward of which stands the town. Westward of Kabotazhnyy mol is a shipbuilding yard and thence the shore is low, sandy and covered with trees as far as Leskovaya kosa, a low sandy point, overgrown with scrub and weeds, about  $1\frac{1}{4}$  miles west-south-westward of the root of Kabotazhnyy mol.

**BUGSKO-DNEPROVSKO-LIMANSKIY KANAL** (*continued from page 246*).—**Ninth to twelfth reaches.**—**Leading lights.**—Leading lights for Kotel'na koleno, the ninth reach, have been established on the western shore. The front light ( $46^{\circ} 45' N.$ ,  $31^{\circ} 53' E.$ ) is exhibited at an elevation of 59 feet (18m0), from a white rectangular framework structure, with a black, vertical stripe, surmounted by a white diamond, 39 feet (11m9) in height, situated about  $2\frac{1}{4}$  miles north-westward of Voloshskaya kosa; the rear light is exhibited, at an elevation of 163 feet

*Chart 2232.*

(49m7), from a similar structure, 26 feet (7m9) in height, situated about half a mile north-westward of the front light.

- Leading lights for Kozyrskoye koleno, the tenth reach, have been established on the western shore. The front light is exhibited, at an elevation of 47 feet (14m3), from a white, circular, stone tower with a black central stripe, surmounted by a triangle, 43 feet (13m1) in height, situated at the mouth of Kozyrskaya balka; the rear light is exhibited, at an elevation of 146 feet (44m5), from a similar tower, 30 feet (9m1) in height, situated on a hill about 6 cables northward of the front light.

Leading lights for Siversovo koleno, the eleventh reach, known as Siversovy leading lights, have been established on the eastern shore, and reciprocal leading lights, known as Siversovy-Obratnyye leading lights, have also been established on the western shore for this reach.

- 15 Siversovy front light is exhibited, at an elevation of 70 feet (21m3), from a white, wooden tripod, carrying a white, rectangular framework structure with a black vertical stripe, surmounted by a triangle, point up, 38 feet (11m6) in height, situated on Siversova kosa; the rear light is exhibited, at an elevation of 202 feet (61m6), from a similar structure, 20 surmounted by a triangle, point down, 47 feet (14m3) in height, situated about  $1\frac{1}{2}$  miles north-eastward of the front light. The old front light-house, consisting of a red, two-storeyed house, with a white, square tower, stands about half a cable south-westward of the present Siversovy front light.

- 25 The front light of Siversovy-Obratnyye leading lights is exhibited, at an elevation of 67 feet (20m4), from a black, rectangular framework structure with a white vertical stripe, surmounted by a triangle, point up, 47 feet (4m3) in height, situated on the western shore about  $1\frac{1}{2}$  miles northward of the mouth of Kotel'naya balka; the rear light is exhibited, 30 at an elevation of 170 feet (51m8), from a similar structure, surmounted by a triangle, point down, 39 feet (11m9) in height, situated about a quarter of a mile south-westward of the front light.

- Leading lights for Konstantinovskoye koleno, the twelfth reach, have been established on the eastern shore. The front light is exhibited, 35 at an elevation of 50 feet (15m2), from a pyramidal framework structure, painted in red and white horizontal bands with a similarly-coloured daymark, and a fan-shaped topmark, 5 feet (1m5) in height, situated about  $1\frac{1}{2}$  cables north-north-eastward of Konstantinovskiy lighthouse (46° 55' N., 32° 01' E.); the rear light is exhibited, at an elevation of 40 101 feet (30m8), from a similar structure, 24 feet (7m3) in height, situated about  $1\frac{1}{2}$  cables north-north-eastward of the front light. These lights in line, bearing about 022½°, lead through the twelfth reach of the dredged channel.

- Buoyage.**—The dredged channel is marked by spar buoys and light-buoys in accordance with the systems described on pages 22–24. Some buoys, outside the dredged channel, mark the outer edges of the shore banks.

- Measured distance.—Beacons.**—A measured distance of 12,152 feet (3,703m9) is marked by two pairs of white posts with wooden supports, surmounted by triangles, point down on the front, and point up on the rear posts, erected on the western shore; the south-western pair stand in the village of Staraya Bogdanovka, and the north-eastern pair on the southern side of Balka Vonyuchiy Yar.

- The course for this measured distance is that of the Siversovy leading line.

Chart 2232.

**DIRECTIONS** (*continued from page 239*).—From the junction of the fifth and sixth reaches, southward of Adzhigol'skaya kosa, vessels should keep between the buoys marking Bugsko-Dneprovsko-Limanskiy kanal, with the respective leading light-structures in line as follows:—

Khablovskiy light-structures bearing  $064\frac{1}{2}^{\circ}$ ; Luparevskiy-Kislyakovskiy bearing  $040\frac{1}{2}^{\circ}$ ; Svyatotoitskiy-Ozarskiye bearing  $003\frac{1}{2}^{\circ}$ ; Kotel'niye bearing  $306^{\circ}$ ; Kozyrskiy bearing  $353\frac{1}{2}^{\circ}$ ; Siversovye bearing about  $042\frac{1}{2}^{\circ}$  or Siversovy-Obratnyye astern, bearing about  $222\frac{1}{2}^{\circ}$ ; and Konstantinovskiy, bearing about  $022\frac{1}{2}^{\circ}$ . On approaching Konstantinovskiy light-structure, course should be shaped to pass close eastward of Ryazhevoy light-buoy, marking the extremity of the groyne extending from the remains of Konstantinovskaya battery; having passed this buoy, course should be altered to bring the rear Siversovye light-structure astern, bearing  $144^{\circ}$  and in line with Konstantinovskiy light-structure, which will lead to the roadstead southward of the city of Nikolayev.

When approaching Nikolayev on the Siversovye leading line and opening that town, a number of grain elevators stand out prominently behind the shipping in the harbour. The observatory, a large white building with a central dome, standing on an elevation in the western part of the town, is also conspicuous.

In the event of the light-buoys being withdrawn, or the leading marks being indistinct, Sary-Kamyshkiye beacons in line, bearing  $326\frac{1}{2}^{\circ}$ , mark the junction of the sixth and seventh reaches, and Sakenskiye beacons in line, bearing  $290\frac{1}{2}^{\circ}$ , mark the junction of the seventh and eighth reaches.

**MYS MALAYA KORENIKHA TO MYS POROKHOVYKH POGREBOV.—Buoyage.**—From Mys Malaya Korenikha ( $46^{\circ} 56' N.$ ,  $31^{\circ} 59' E.$ ) the western shore trends west-south-westward for about  $1\frac{1}{2}$  miles to Mys Didova Khata, and thence curves westward and north-westward for about  $2\frac{1}{2}$  miles to the mouth of a valley, on both sides of which stand the houses of the village of Bol'shaya Korenikha. The northern side of this valley terminates at the shore in a bluff on which there is a cemetery. Both the village and the cemetery are good landmarks on this reach of the river. The whole of this stretch of coast is steep-to, the coastal bank, with depths of less than 18 feet (5m5), nowhere extending more than one cable offshore.

From Leskovaya kosa the eastern shore trends north-westward for about  $1\frac{1}{2}$  miles to Spasskaya kosa, a narrow, sandy point which projects about 3 cables from the general line of the coast. This stretch of coast is covered with reeds and is fronted by an extensive bank which, with depths of less than 6 feet (1m8), extends about  $6\frac{1}{2}$  cables southward from Leskovaya kosa and from the shore for about half a mile north-westward of that point; thence this bank becomes narrower and extends only about  $2\frac{1}{2}$  cables westward from Spasskaya kosa.

A light-buoy, painted black and white and exhibiting a *white flashing* light, with a black spar buoy, surmounted by a flat, moored close to it, mark the southern extremity of the bank about  $6\frac{1}{2}$  cables southward of Leskovaya kosa, and a light-buoy, painted black and exhibiting a *white flashing* light, with a black spar buoy surmounted by a flag, moored close to it, mark the western extremity of the bank about 3 cables west-north-westward of Spasskaya kosa. Between these light-buoys, the outer edge of the bank is marked by black spar buoys each surmounted by a cone.

From the bluff on which is the prominent cemetery, mentioned above, the western shore trends north-eastward for about 3 miles to the village of Varvarovka and is high and rocky; thence it trends northward and

*Chart 2232.*

becomes sloping for about one mile to Varvarovskiy mys, which is low. A stone pier partly in ruins, extends southward from the shore abreast the village of Varvarovka.

- 5 The southern part of this stretch of coast is steep-to, but from a position about 4 cables south-westward of the village of Varvarovka, the coastal bank, with depths of less than 18 feet (5m5), extends farther into the river, being about 3 cables offshore at about the same distance south-westward of the pier; about 5 cables offshore, abreast the northern part  
10 of the village; and about three-quarters of a mile offshore, eastward of Varvarovskiy mys. This bank is very steep-to abreast the village, there being depths of 6 feet (1m8) close within its outer edge, which here is marked by a red spar buoy surmounted by a cone, point down.

- A small 6-foot (1m8) patch lies about 6½ cables off the western shore  
15 and about one mile north-eastward of the southern extremity of the pier at Varvarovka.

- From Spasskaya kosa the eastern shore trends north-eastward for about 2½ miles to Mys Porokhovyykh Pogrebov (46° 59' N., 31° 59' E.) and for the first mile, is covered with trees and villas. Spasskaya pristan'  
20 projects a short distance from the shore about midway along this stretch of coast, and about a quarter of a mile north-eastward of the pier, Varvarovskiy pontoon bridge crosses the river to the head of Varvarovka pristan'; the bridge is opened daily at fixed hours for the passage of vessels. From the south-eastern end of Varvarovskiy pontoon bridge, the eastern  
25 shore becomes high and rocky and terminates in a steep cliff at Mys Porokhovyykh Pogrebov, which is the southern entrance point of Reka Ingul.

**SPASSKIY KANAL TO REKA INGUL.—Spasskiy kanal.—**

- Buoyage.**—Spasskiy kanal, which leads to the mouth of Reka Ingul, has  
30 been dredged from a position about one mile westward of Mys Didova Khata to Varvarovskiy bridge. In 1951, it had a width of 350 feet (106m7) and a depth of 21 feet (6m4).

- This channel is marked by black spar buoys on the starboard hand ascending the river, and red spar buoys on the port hand, surmounted  
35 by flags of the same colour. The buoys marking the shore banks on either side of the channel are described on page 249.

- Submarine cables.—Buoys.—Prohibited anchorage.**—Two submarine cables cross the river in a north-westerly direction, one from Mys Porokhovyykh Pogrebov and the other from a position about a quarter of  
40 a mile farther west-south-westward. The routes of these cables are marked by a number of spar buoys, painted black and yellow and surmounted by narrow vertical shapes. The shore ends of these cables on the eastern shore are each marked by a pair of black and yellow beacons, each surmounted by a disc. Anchorage is prohibited on or between the  
45 lines of these beacons.

**Prohibited area.**—Navigation is prohibited within an area marked by black and white buoys situated northward of Mys Porokhovyykh Pogrebov on the northern side of the entrance to Reka Ingul. A shoal with a depth of 6 feet (1m8) lies in the middle of this area.

- 50 **Spoil grounds.—Caution.**—Spoil grounds exist on either side of Spasskiy kanal, one on its eastern side between Leskovaya kosa and Spasskaya kosa, and the other on the north-western side of the northernmost reach of the channel.

- Vessels should keep closely to the channel in the vicinity of these  
55 spoil grounds.

*Chart 2232.*

**Reka Ingul and approach.—Channel.—Buoyage.**—The entrance to Reka Ingul lies between Mys Porokhovyykh Pogrebov ( $46^{\circ} 59' E.$   $31^{\circ} 59' E.$ ) and Nikolayevskiy mys, about half a mile south-eastward. Within the former point the southern bank is high, rocky and steep-to, and near this point are some buildings surrounded by a high wall with towers at its corners. 5

A dredged channel, in which there were depths of 26 feet (7m9), in 1933, extends from Varvarovskiy pontoon bridge to a position abreast Mys Porokhovyykh Pogrebov. It is marked by spar buoys in accordance with the systems described on pages 22–24. 10

About three-quarters of a mile south-eastward of Mys Porokhovyykh Pogrebov, Reka Ingul is crossed by a pontoon bridge which can be opened for the passage of shipping. Immediately above this bridge, on the northern side of the river, is the naval yard. 15

The northern side of the river is low, sandy and covered with reeds.

Vessels of war secure alongside the southern bank of the river between Mys Porokhovyykh Pogrebov and the bridge, and alongside the northern bank above the bridge.

A flat, with depths of less than 6 feet (1m8), extends north-westward from Nikolayevskiy mys, on the northern side of the entrance, to a position about one cable north-eastward of Mys Porokhovyykh Pogrebov. 20

**NIKOLAYEVSKIY PORT.**—The port and city of Nikolayev ( $46^{\circ} 59' N.$ ,  $31^{\circ} 58' E.$ ) with a population, in 1967, of 289,000, covers a large area of the promontory formed between Reka Bug and Reka Ingul. There are no climatic diseases, but during the hot season, river fish and raw fruit should be avoided as they are liable to produce diarrhoea and cholera. There are several hospitals in the town. 25

The Commercial Port lies on the southern side of the town and consists of two adjacent ports. Zagraničnyy (foreign) port, and Kabotazhnyy (coasting trade) port. The latter lies within Kabotazhnyy mol, page 252; Zagraničnyy port includes the roadstead southward, in which there is a least depth of 25 feet (7m6), and which affords shelter from all winds. The principal exports are grain, iron and manganese ore. 30

**Port regulations.**—Masters of vessels must report their arrival to the Port Authorities by letter, radio or through their agents, and should obtain a copy of the Port Regulations. 35

Vessels are not allowed to lie at anchor in the roadstead, but go alongside the quays in Zagraničnyy port and secure to buoys laid close off them. Coasters berth alongside either side of Kabotazhnyy mol. 40

See also the regulations on page 15.

**Quays.—Depths.**—Zagraničnyy port has three masonry quays with an effective berthing length of 7,000 feet (2,133m6), and a least depth alongside, in 1946, of 23 feet (7m0).

Rabotazhnyy mol has a total length of 3,330 feet (1,015m0) available for berthing. In 1937, there were depths of 22 feet (6m7) alongside the outer side and from 16 to 18 feet (4m9 to 5m5), alongside the inner side. There is a jetty inside Kabotazhnyy port. 45

Neftyanaya pristan', the oiling jetty, is situated about a quarter of a mile westward of the root of Kabotazhnyy mol. 50

A channel, marked by spar buoys surmounted by cones, leads from the main river channel to the shipbuilding works westward of Kabotazhnyy mol.

**Port facilities.—Radio station.**—A large stock of coal is maintained. It is supplied by transporter or by hand direct from the quay. 55

**Chart 2232.**

Small stocks of fuel oil is maintained for the U.S.S.R. Naval authorities.

Supplies and provisions are plentiful. Fresh water suitable for drinking  
5 is laid on to the quays.

Kabotazhnyy mol and the quays of Zagranichnyy port are connected with the general railway system. There are a number of cranes, ashore and afloat, capable of lifting from  $1\frac{1}{2}$  to 25 tons. Tugs are available.

Repairs to vessels can be undertaken. There are two floating docks;  
10 for dimensions of the larger, *see* Appendix I.

Ice-breakers, with all appliances for rendering assistance to vessels in distress, are available. There is also a launch, fitted with pumps and fire-fighting equipment.

There is regular sea communication with Odessa, Kherson, Nikopol,  
15 Ochakov and Voznesensk.

There is a radio station at Nikolayev ( $46^{\circ} 59' N.$ ,  $31^{\circ} 58' E.$ ).

**Quarantine.**—The Quarantine station is situated off Ochakov, *see* page 232.

**De-ratting.**—De-ratting can be carried out at Nikolayev, *see* page 27.

20 **Storm signals.**—**Ice.**—**Depth signals.**—Storm signals, *see* page 18, are displayed from a mast situated at the head of Kabotazhnyy mol. Weather and ice bulletins are displayed daily at the Harbour office, situated near the quays in Zagranichnyy port. For Ice, *see* pages 27-28 and 32-36.

Depth signals, *see* page 21. Information on the height of water in the  
25 river and estuary is also displayed at the Harbour office.

**Life-saving.**—There is a life-saving station, with a lifeboat, at the Commercial port.

**Climatic table.**—*See* page 77.

## CHAPTER VII

NORTHERN SHORE OF THE BLACK SEA: KINBURNKAYA KOSA  
TO MYS OPUK

**GENERAL CAUTION.**—Due to the absence of up-to-date information, particular caution should be exercised when navigating in the area described in this chapter.

*Chart 2212.*

**KINBURNKAYA KOSA TO TENDROVSKAYA KOSA.—Coast.** 5  
**Navigational aids.**—From the north-western extremity of Kinburnskaya kosa ( $46^{\circ} 35' N.$ ,  $31^{\circ} 30' E.$ ) (page 231) the low, sandy coast of the peninsula trends south-eastward for about 12 miles to the northern entrance point of Yegorlytskiy zaliv.

Kinburnskiy light on the extremity is described on page 234. 10

A beacon, consisting of a black shield with a white vertical stripe, 26 feet (7m9) in height, stands at a coastguard station about  $5\frac{1}{2}$  miles south-eastward of the north-western extremity of Kinburnskaya kosa.

A pyramidal, framework beacon surmounted by a shield, 52 feet (15m8) in height, is situated about  $2\frac{1}{2}$  miles north-north-westward of 15 the northern entrance point of Yegorlytskiy zaliv, and a grey stone building stands on the coast, about half a mile north-westward of the same point.

The off-shore obstructions in this vicinity are described on page 234.

A light-buoy, painted black and white, exhibiting a *white flashing* light, 20 is moored 7 miles south-south-westward of the northern extremity of Kinburnskaya kosa.

**Local magnetic anomaly.**—See page 233.

**Yegorlytskiy zaliv.—Light.—Beacon.—Anchorage.**—Yegorlytskiy zaliv is entered between its northern entrance point and the western 25 extremity of Poluostrov Yegorlytskiy kut, the peninsula which forms its southern side, about  $7\frac{1}{2}$  miles south-south-eastward. The bay affords spacious shelter to small vessels from all but westerly winds, in depths of from 7 to 18 feet (2m0 to 5m4), soft mud, sand and shells.

Ostrov Kruglyy and Ostrov Dolgiy, two low, sandy islands, lie near 30 the edge of a shallow flat which extends about  $5\frac{1}{2}$  miles south-eastward from the northern entrance point of the bay, and appear as a continuation of the south-western coast of Kinburnskaya kosa.

Yegorlytskiy light is exhibited, at an elevation of 31 feet (9m4), from a black metal framework column, 28 feet (8m5) in height, situated on the 35 southern extremity of Ostrov Dolgiy, about 5 miles south-eastward of the northern entrance point of the bay.

The entrance channel to Yegorlytskiy zaliv lies between the southern extremity of Ostrov Dolgiy and the northern coast of Poluostrov Yegorlytskiy kut, and is about  $2\frac{1}{2}$  miles wide, but the fairway, with a least charted 40 depth of 12 feet (3m7), is only about one mile wide.

Poluostrov Yegorlytskiy kut is flat and marshy and has a few scattered sheepfolds and tumuli on it.



*Chart 2212.*

The shores of Yegorlytakiy zaliv are generally low. The northern shore consists of sand hills some of which are wooded, and the village of Pokrovka, situated among the sandhills at the north-western corner of the bay, extends over a considerable area. The village of Svobodny Port is situated on the southern shore of the bay, 2 miles within the entrance, and Ivanovka village ( $46^{\circ} 22' N.$ ,  $32^{\circ} 05' E.$ ) stands at the head of the bay inshore of Ostrov Velikiy and Ostrov Konskiy. These villages are connected by road with Prognoi (page 239).

10 Weed, growing from the bottom, is very abundant and is liable to foul the propellers as it attains a great length by midsummer. Landing is impossible in the eastern part of the bay, the shore there being fronted by a shallow bank of soft ooze.

The usual anchorage is about 2 miles eastward of Ostrov Dolgiy, in 15 depths of from 12 to 16 feet (3m7 to 4m9). North-westerly winds force the water into the bay, causing a current which sets round it.

**Tendrovskaya kosa.**—**Navigational aids.**—Tendrovskaya kosa (Tendra peninsula), lies with its northern extremity ( $46^{\circ} 22' N.$ ,  $31^{\circ} 31' E.$ ) about 10 miles westward of the southern extremity of Ostrov 20 Dolgiy. Its northern part is about one mile wide and from it the peninsula trends southward for about 4 miles, whence it becomes very narrow and trends east-south-eastward for about 32 miles to the mainland, forming the southern side of Tendrovskiy zaliv, *see* page 255. There is a narrow passage through the eastern part of The Tendra.

25 The narrow part of Tendrovskaya kosa is quite bare except for an occasional sheepfold but there are a few trees on the northern, wider part, between its extremity and about 3 miles southward.

A light is exhibited, at an elevation of 52 feet (15m9), from a black, metal framework structure, 26 feet (7m9) in height, situated on the eastern 30 side of the northern extremity of Tendrovskaya kosa.

Tendrovskiy light is exhibited, at an elevation of 96 feet (29m3), from a white, circular tower with two black bands, 88 feet (26m8) in height, situated on the western coast about 3 miles southward of the northern extremity of Tendrovskaya kosa. A fog signal is sounded and a radio- 35 beacon transmits from the lighthouse.

Tendrovskiy-Zheleznyy ( $46^{\circ} 09' N.$ ,  $32^{\circ} 04' E.$ ) light is exhibited, at an elevation of 64 feet (19m5), from a black, metal mast surmounted by a rectangular daymark, situated on the eastern part of Tendrovskaya kosa about 25 miles east-south-eastward of Tendrovskiy lighthouse.

40 Depths of up to 36 feet (11m0) extend as much as 5 miles off the southern side of The Tendra.

A 29-foot (8m8) patch lies about  $13\frac{1}{2}$  miles south-south-westward of Tendrovskiy light.

45 **Obstruction.**—An obstruction lies about 3 miles south-south-westward of Tendrovskiy light.

**Current.**—**Caution.**—The lowness of Tendrovskaya kosa renders it dangerous, especially as the current, which may set eastward, is variable in strength. This east-going current is strongest with westerly winds. Vessels bound for Odessa from southward often sight Tendrovskiy 50 lighthouse when expecting to make that port. During foggy weather, therefore, vessels in this vicinity should sound continuously and proceed with great caution.

**Prohibited anchorage.**—An area in which anchoring and fishing are prohibited exists westward of the north-western end of The Tendra; this 55 area, which extends about 2 miles offshore, is indicated on the chart.

**Anchorage.**—Temporary shelter from northerly winds may be

*Chart 2212.*

obtained in convenient depths anywhere off the southern side of The Tendra.

**Tendrovskiy zaliv.—Navigational aids.—Anchorage.**—Tendrovskiy zaliv (Tendra bay) is entered between the northern extremity of Tendrovskaya kosa and the south-western coast of Kinburnskaya kosa, about 8 miles north-eastward. The eastern part of the bay is entered between the western extremity of Poluostrov Yegorlyskiy kut and Kosa Belyye Kuchugury, a point on the northern side of The Tendra, about  $4\frac{1}{2}$  miles south-westward, within which lie some white sand dunes. This part of the bay is shallow and a flat, with depths of about 3 feet (0m9), extends across its entrance. Ostrovok Orlov, a low islet, lies on this flat about midway between the entrance points.

A light is exhibited from a position on the northern side of Kosa Belyye Kuchugury, about one mile westward of its extremity.

An obstruction, with a depth of 33 feet (10m1) over it, lies  $1\frac{1}{2}$  miles east-south-eastward of the northern extremity of Tendrovskaya kosa. Several other obstructions, some of which are marked by spar buoys fitted with radar reflectors, exist in the western part of Tendrovskiy zaliv.

An area of foul ground extends three-quarters of a mile offshore on the northern side of Kosa Belyye Kuchugury.

There is good anchorage in Tendrovskiy zaliv with shelter from all but north-westerly winds which send in a considerable sea. The best berth is in depths of from 42 to 45 feet (12m8 to 13m7), stiff mud and large shells, abreast Tendrovskiy lighthouse about  $1\frac{1}{2}$  miles offshore. Vessels can lie closer inshore but should approach with caution as the coastal bank is very steep to within depths of 36 feet (11m0).

In the western part of the bay the nature of the bottom is mud and large shells and is excellent holding ground; farther eastward it changes to mud with sand and shells, then to shells, and, finally, to small shells.

**Winds.**—The prevailing winds in autumn and winter are north-easterly. From March to May, inclusive, north-westerly winds are more common than winds from other directions during the daytime. The strongest winds occur from October to March. There is seldom much wind in July.

Gales may occur in any month except June and July, but they are most frequent in October and November.

**Ice.**—Ice forms in Tendrovskiy zaliv towards the end of December and disappears about the end of February or early in March. It attains a thickness of about 16 inches (0m4). In the offing, ice, mostly drift-ice, appears at the beginning of January and disappears towards the end of February and may clear several times during this period.

*Chart 2232.*

**KARKINITSKIY ZALIV.—General remarks.**—Karkinitskiy zaliv (Gulf of Perekop) is entered between the western extremity of Tendrovskaya kosa ( $46^{\circ} 20' N.$ ,  $31^{\circ} 31' E.$ ) and Mys Tarkhankut (Cape Tarkhan), the western extremity of the Crimea, about 71 miles south-eastward. It is divided into two parts by Bakal 'skaya banka, the shores of the inner part being much indented. The entrance to the inner part of the bay lies northward of Bakal 'skaya banka through a channel with a depth of 25 feet (7m6) in the fairway.

There are three refuges from westerly and south-westerly winds in Karkinitskiy zaliv; Ak-Mechetskaya bukhta (Akmechet harbour), situated in the outer part of the bay about 13 miles north-eastward of Mys Tark-

*Chart 2232.*

hankut; Dzharylgachskiy zaliv (Dzharuigach bay), on the northern side of the inner part of the bay; and Bakal'skaya bukhta, eastward of Bakal'skaya banka.

- 5 **Currents.—Caution.**—The currents in this bay are mainly due to the influence of the wind and attain a rate of about half a knot. North-easterly winds drive the water out of the bay, and south-westerly winds have the opposite effect. The strongest currents are those caused by westerly winds.

- 10 Near Mys Tarkhankut changes of wind, squalls, or sudden calms are often experienced, and the sea is often short and broken. Off this point the wind generally blows from north-east during the night.

A change takes place in the colour of the sea off Mys Tarkhankut, from a bright blue to a dark and dirty green in the shallow areas; this

- 15 colour gradually deepens as Odessa is approached.

**Ice.**—Dzharylgachskiy zaliv usually freezes over; the ice first appears in the middle of December and disappears during the latter half of March.

- General caution.**—Due to lack of information about up-to-date  
20 navigational aids, great caution should be exercised in this area.

#### NORTHERN SIDE OF OUTER PART OF KARKINITSKIY ZALIV.

- Aspect.—Navigational aids.**—The southern coast of Tendrovskaya kosa, described on page 254, forms the western part of the northern side of Karkinitskiy zaliv. From the junction of Tendrovskaya kosa  
25 with the mainland, the coast trends east-south-eastward for about 14 miles and is somewhat more elevated; thence Dzharylgachskaya kosa, a narrow strip of land, extends eastward for about 22 miles and terminates in Mys Dzharylgachskiy, forming the southern side of Dzharylgachskiy zaliv (Dzharvilgach bay). The western part of this strip of land is only  
30 about one cable wide, but about 10 miles westward of Mys Dzharylgachskiy it widens and, for the remainder of its length, is known as Ostrov Dzharylgach (Dzharylgatskiy).

- The following objects on this side of the bay are good landmarks:—Tendrovskiy-Zheleznyy light-structure (page 254); the village of Klaravka,  
35 in which there are several windmills, situated about 2 miles inland about midway between Tendrovskiy zaliv and Dzharylgachskiy zaliv; Novo-Alekseyevka (Sofiyevka) ( $46^{\circ} 05' N.$ ,  $32^{\circ} 31' E.$ ), a village with a large orchard, situated near the western end of Dzharylgachskiy zaliv; several flat-topped hills between these two villages which stand out well against  
40 the sandy shore; and the villages of Limanskiy, Krasnoye and Port Skadovsk, all situated on the northern shore of Dzharylgachskiy zaliv, about 5, 9 and 15 miles, respectively, eastward of the village of Novo-Alekseyevka, and visible from seaward over Dzharylgachskaya kosa.

- Perelyaga beacon, the top of which has an elevation of 50 feet (15m2),  
45 consisting of a black, four-sided, pyramidal framework structure, with a central staff, surmounted by a cylinder and 40 feet (12m2) in height, stands on Dzharylgachskaya kosa about 13 miles westward of Mys Dzharylgachskiy.

- Sofiyevskiy light is exhibited, at an elevation of 57 feet (17m4), from  
50 a black metal, framework structure, 52 feet (15m8) in height, situated on the coast close westward of the western end of Dzharylgachskiy zaliv.

Dzharylgachskiy light is exhibited, at an elevation of 80 feet (24m4), from a white, metal, framework structure, 74 feet (22m6) in height, situated about half a mile within the extremity of Mys Dzharylgachskiy.

- 55 A fog signal is sounded from the lighthouse. See view [11].

*Chart 2232.*

**Prohibited anchorage.**—An area extending south-south-westward from the coast, in which anchoring and fishing are prohibited, is indicated on the chart about 3 miles south-westward of Klaravka village ( $46^{\circ} 08' N.$ ,  $32^{\circ} 24' E.$ ). 5

**SOUTHERN SIDE OF OUTER PART OF KARKINITSKIY ZALIV.**—**Aspect.**—**Navigational aids.**—The southern shore of Karkinitskiy zaliv is formed by the north-western coast of the Crimea, within which are elevated plains. The whole stretch of coast between Mys Tarkhankut ( $46^{\circ} 21' N.$ ,  $32^{\circ} 30' E.$ ) and a position about 3 miles westward of Bakal'skaya banka, is steep-to. 10

Between Mys Tarkhankut, which is low and rocky, and Mys Karamrun, about  $2\frac{1}{2}$  miles northward, the coast is red in colour, but eastward of the latter point it changes and consists of whitish cliffs intersected by valleys. Between Mys Karamrun and Ak-Mechetskaya bukhta (Akmechet harbour), about 12 miles east-north-eastward, the cliffs are broken and irregular but become more regular in outline on approaching Ak-Mechetskaya bukhta; eastward of the harbour they are higher, but gradually become lower towards Bukhta Yarylgach (Yaruilgach), about 5 miles farther east-north-eastward. On the eastern side of Bukhta Yarylgach the coast rises again to Mys Kara-Burnu and becomes rocky and reddish in colour; thence it gradually decreases in elevation to Bakal'skaya kosa, about 16 miles east-north-eastward of Mys Kara-Burnu. 15 20

The following objects on this stretch of coast make good landmarks:— 25  
A white, square tower and two windmills at the village of Ak-Mechet; Burun-Eli coastguard station, about 9 miles east-north-eastward of Mys Kara-Burnu; Pekhovskogo farmhouse, a small white house amongst others about  $1\frac{1}{2}$  miles east-north-eastward of the coastguard station; and a large mill at Byuiten' farm, situated about  $5\frac{1}{2}$  miles eastward of Pekhovskogo farmhouse. 30

Tarkhankut light is exhibited, at an elevation of 117 feet ( $35m7$ ), from a white, circular, stone tower, 108 feet ( $32m9$ ) in height, situated on Mys Tarkhankut. The lighthouse and the adjoining buildings are enclosed by a stone wall. 35

A radiobeacon transmits and a fog signal is sounded from a position near the lighthouse. See Appendix III.

**Obstructions.**—In 1919, an obstruction was reported by H.M.S. *Swallow* in a position about 2 miles westward of Mys Tarkhankut ( $45^{\circ} 21' N.$ ,  $32^{\circ} 30' E.$ ). 40

**Currents.**—About 20 miles west-north-westward of Mys Tarkhankut a fairly strong current sets eastward with westerly, and westward with easterly winds.

In 1929, a constant current was observed to set north-westward at a rate of one-fifth of a knot in a position about half a mile south-westward of Mys Tarkhankut. The rate of this current was increased by north-westerly winds; its direction appeared to be variable. 45

**Karadzhinskaya bukhta.**—**Dangers.**—**Buoys.**—**Anchorage.**—Karadzhinskaya (Karadzha) bukhta is entered between Mys Tarkhankut and Mys Karamrun, about  $2\frac{1}{2}$  miles north-north-westward. Mys Karamrun is a high, rounded bluff with a reddish-coloured summit. There is a sandy beach at the head of the bay within which is a salt lake with the village of Karadzha situated on its eastern side. The nature of the bottom in the bay is sand and mud. Near the shore at the north-eastern corner of the bay is a school with a tower and spire, the top of which has an eleva- 50 55

*Chart 2232.*

tion of 92 feet (28m0), and forms a good mark when anchoring. A small wooden pier projects southward from the shore about  $2\frac{1}{2}$  cables westward of the two-storeyed house.

- 5 A sunken ridge on which there are several rocks with depths of less than 6 feet (1m8) over them, extends about one mile westward and west-north-westward from Mys Tarkhankut; two spar buoys, each surmounted by two cones, bases together, mark the extremity of the ridge. The highest cliff near Mys Karamrun bearing 009° and open westward of that point, leads close westward of the ridge in a least depth of 30 feet (9m1).

The northern shore of the bay is fringed by a bank which, with depths of less than 18 feet (5m5) extends as much as  $2\frac{1}{2}$  cables offshore. A rock which dries, and several sunken rocks, lie on this bank.

Karadzinskaya bukhta affords good anchorage during easterly winds.

- 15 The best berth is in depths of from 33 to 48 feet (10m1 to 14m6), near the north-eastern corner of the bay.

- Coast.**—North-eastward of Mys Karamrun ( $45^{\circ} 23' N.$ ,  $32^{\circ} 29' E.$ ) there is a remarkable point which rises from the sea in four steps. Kovsh Kipchak, a small cove with steep shores, situated about 7 miles north-eastward of Mys Karamrun, affords shelter to small craft with local knowledge from all winds except those between west-north-west and north-east.

- Prohibited anchorage.**—An area extending nearly  $3\frac{1}{2}$  miles from the coast, in which anchoring and fishing are prohibited, is indicated on the chart close south-westward of the western entrance point of Ak-Mechetskaya bukhta (*see below*).

- Ak-Mechetskaya bukhta.—Dangers.—Navigational aids.**—Ak-Mechetskaya (Akmechet) bukhta, also known as Bukhta Uzkiye, is entered between a point about 12 miles north-eastward of Mys Karamrun and a point about  $6\frac{1}{2}$  cables farther east-north-eastward. It is much frequented by vessels trading between Odessa and the Crimea. The village of Ak-Mechet is situated on the southern shore of the bay.

- The outer entrance points are about 20 feet (6m1) high and are rocky and reddish in colour; within them are two inner entrance points of about the same elevation but formed of clay and rock. There is a small cove on either side of the entrance between the outer and inner entrance points.

- The best landmarks for identifying the entrance are the white, square tower of a building, formerly a church, standing on the level shore of the southern side of the bay, and, southward of it, two windmills, one of which has a red roof.

- A bank with depths of less than 18 feet (5m5) extends about 2 cables east-north-eastward from the outer, and a similar distance north-eastward from the inner western entrance point; its outer edge is steep-to off the former point. A similar bank, the outer edge of which is steep-to, extends about  $1\frac{1}{2}$  cables westward of the outer eastern entrance point. Ak-Mechetskiy light, *see below*, is obscured over both these banks.

- A spar buoy, painted red and white and surmounted by two red cones, points together, marks the eastern edge of the bank extending off the inner western entrance point.

Within the inner entrance the shores of the bay gradually become low and shelving and are fringed by a shallow bank on which are several sunken rocks, which make landing difficult.

- Ak-Mechetskiy light ( $45^{\circ} 31' N.$ ,  $32^{\circ} 42' E.$ ) is exhibited, at an elevation of 42 feet (12m8), from a white shield with a black vertical stripe, 33 feet (10m1) in height, situated on the southern shore of the bay northward of

*Chart 2232.*

the village. This light-structure is situated at a lower elevation than the white, square tower mentioned above, and is not so prominent.

Ak-Mechetskiy light bearing  $186^{\circ}$  and in line with the windmill with the red roof, leads into the bay midway between the banks extending from the entrance points. 5

Leading light-beacons have been established on the south-eastern side of the bay. The front light is exhibited at an elevation of 49 feet (14m9), from a white shield with a black vertical stripe, 26 feet (7m9) in height, situated about  $5\frac{1}{2}$  cables east-south-eastward of Ak-Mechetskiy light-structure; the rear light is exhibited, at an elevation of 91 feet (27m7), from a similar structure, 49 feet (14m9) in height, situated about  $1\frac{1}{2}$  miles south-eastward of the front light. These light-beacons in line, bearing about  $131\frac{1}{2}^{\circ}$ , lead into the bay. 10

**Anchorage.**—The best berth is in a depth of 25 feet (7m6), mud and shells, midway between the inner entrance points. This anchorage is exposed to north-westerly winds but small craft may obtain anchorage sheltered from these winds, in depths of from 9 to 12 feet (2m7 to 3m7), in a cove within the inner western entrance point. This cove rarely freezes over. 15 20

**Port facilities.—Storm signals.**—A small stone jetty with a pier, off the head of which is a depth of 8 feet (2m4), is situated about half a cable westward of Ak-Mechetskiy light-structure.

Fresh provisions may be obtained. There is a hospital in the village of Ak-Mechet. 25

Storm signals, *see* page 18, are displayed from a mast near Ak-Mechetskiy light-structure.

**Ice.**—Ak-Mechetskaya bukhta sometimes freezes over in winter.

**Bukhta Yarylgach.—Dangers.—Navigational aids.—Anchorage.**—Bukhta Yarylgach (Yaruilgach) is entered between a point about 4 miles east-north-eastward of the eastern entrance point of Ak-Mechetskaya bukhta and Mys Kara-Burnu ( $45^{\circ} 35' N.$ ,  $32^{\circ} 49' E.$ ), about  $1\frac{1}{2}$  miles farther north-eastward. Mys Kara-Burnu is low and rocky, with a dark extremity which stands out well against the whitish-coloured coast in the vicinity. 30 35

A light is exhibited, at an elevation of 52 feet (15m8), from a white, truncated pyramid, with a black vertical stripe, 27 feet (8m2) in height, situated on Mys Kara-Burnu.

The village of Yarylgach is situated on low ground on the north-eastern side of the bay; some windmills in the village are visible from seaward. 40

Rocky ledges, with depths of less than 18 feet (5m5), extend up to 4 cables north-eastward from the south-western entrance point, about  $5\frac{1}{2}$  cables south-westward from Mys Kara-Burnu, and as much as 7 cables from the southern shore of the bay. There are depths of from 36 to 45 feet (11m0 to 13m7), sand over rock, in the middle of the bay. 45

The north-eastern part of the bay is partly sheltered from seaward by Mys Kara-Burnu and the ledge extending from it, but the bay is open to westerly winds and anchorage in it is untenable with strong winds from between south-west and north-west.

Two piers extend from the eastern shore of the bay; the northern pier has a depth of 18 feet (5m5) at its head, and the southern pier, 14 feet (4m3). 50

A red buoy surmounted by two cones, bases together, is moored about 4 cables west-north-westward of the northern pier and indicates the anchorage. 55

Leading light-beacons have been established for entering Bukhta

*Chart 2232.*

Yarylgach. The front light is exhibited, at an elevation of 23 feet (7<sub>m</sub>0), from a white shield with a black vertical stripe, surmounted by a triangle, point up, 16 feet (4<sub>m</sub>9) in height, situated near the piers on the eastern shore of the bay; the rear light is exhibited, from a similar beacon, surmounted by a triangle, point down, situated about 1½ cables eastward of the front light. These light-beacons in line bearing 088½°, lead through the fairway of the entrance to the anchorage.

**Pilotage.**—Pilotage is compulsory for merchant vessels entering Bukhta Yarylgach; a pilot can be obtained from the pilot station at Skadovsk, see page 263.

**Coast.—Bank.—Buoyage.**—From Mys Kara-Burnu the coast trends east-north-eastward for about 16 miles to the root of Bakal'skaya kosa, a sandy projection which extends about 4 miles northward from the general line of the coast and terminates in Mys Kyn Murun (45° 48' N., 33° 11' E.); Ozero Bakal'skoye, which is salt, is situated on its southern part.

Bakal'skaya banka, a long, narrow spit, extends about 10 miles northward from Mys Kyn Murun. There is a least depth of 6 feet (1<sub>m</sub>8) on the spit, the eastern edge of which is steep-to. The western edge of the spit is shelving. The depths on the spit are liable to change.

The northern edge of Bakal'skaya banka is marked by Bakal'skiy light-buoy, painted white and exhibiting a *white flashing* light every five seconds, with a white spar buoy surmounted by a black cone, point up, moored close to it. The eastern edge of the northern part of the spit is marked by a spar buoy, painted red and white and surmounted by a cross, moored about 2½ miles south-south-eastward of Bakal'skiy light-buoy.

About 2½ miles northward of Mys Kyn Murun (45° 48' N., 33° 11' E.) there is a narrow channel or swashway across Bakal'skaya banka. In 1966, there was a depth of 14 feet (4<sub>m</sub>3) in the fairway of this channel which is marked by two spar buoys on each side; those on the southern side are painted black and each surmounted by a cone, point up, and those on the northern side are painted red and surmounted by a cone, point down.

**INNER PART OF KARKINITSKIY ZALIV.—Aspect.**—The inner part of Karkinitskiy zaliv is entered between Mys Dzharylgachskiy (page 256) and Mys Kyn Murun, about 13 miles south-south-eastward. Its shores are much indented by shallow bays, fronted by extensive shallow flats which occupy about half its area. This part of Karkinitskiy zaliv terminates north-eastward in Perekopskiy zaliv (Perekopskaya bukhta) which is very shallow and at the head of which is the isthmus which joins the Crimea with the mainland and separates Karkinitskiy zaliv from Sivash sea (page 324), generally known as Sivash, eastward. On this isthmus is the village of Perekop which is connected by rail with Kherson and ports in the Crimea.

The shores of the inner part of Karkinitskiy zaliv are generally low and flat and in summer, especially about midday, identification of the coast is sometimes rendered very difficult by mirage.

The best landmarks are:—Dzharylgachskiy lighthouse; the yellow cliffs of Mys Khorly, about 9½ miles east-north-eastward of Mys Dzharylgachskiy; the white ruins of the old Bakal'skiy coastguard station, about 4 miles south-south-eastward of Mys Kyn Murun; and the old Saray-Bulat coastguard station which, with the white church of Saray-Bulat monastery, now a farm, is situated about 12½ miles east-north-eastward of Bakal'skiy coastguard station.

*Chart 2232.*

The inner part of Karkinitskiy zaliv affords secure anchorage in several places to vessels that can cross the bar between Mys Dzharylgachskiy and the northern extremity of Bakal'skaya banka. The ports of Skadovsk and Khorly are situated on the northern shore, about 9 miles north-westward, and 10 miles east-north-eastward, respectively, of Mys Dzharylgachskiy. 5

**Pilotage.**—Pilotage is compulsory for merchant vessels proceeding to all ports in Karkinitskiy zaliv. Inward bound vessels will pick up a pilot off the eastern end of Ostrov Dzharylgach. Vessels are advised to report their expected time of arrival in the approaches to the Harbour-master at Skadovsk at least 24 hours beforehand. 10

Pilots for Skadovsk, Khorly, Bakal'skaya bukhta, Sary-Bulat and Yarlygach may be obtained from the pilot station at Skadovsk.

**Entrance channel.**—**Dangers.**—**Buoyage.**—The main entrance channel to the inner part of Karkinitskiy zaliv lies between Mys Dzharylgachskiy ( $46^{\circ} 01' N.$ ,  $33^{\circ} 04' E.$ ) and the northern extremity of Bakal'skaya banka (page 260), about 4 miles south-eastward. The fairway of the channel is narrowed to a width of about one mile, with depths of 25 feet (7m6), between the coastal bank fringing the eastern end of Ostrov Dzharylgach and the shoals lying north-westward of the northern extremity of Bakal'skaya banka. 15 20

Bakal'skiy light-buoy and spar buoy, marking the northern extremity of Bakal'skaya banka, are described on page 260.

A shoal with a least depth of 18 feet (5m5) lies with its northern extremity about  $1\frac{1}{2}$  miles south-south-westward of Mys Dzharylgachskiy. A white buoy, with a white spar buoy surmounted by a black cone, point up, close to it, are moored close northward of the shoal, and mark the southern side of the entrance channel. This shoal is covered by a red sector of Dzharylgachskiy light, between the bearings of  $304^{\circ}$  and  $015^{\circ}$ . 25 30

A red spar buoy surmounted by a cone, point down, is moored about 5 cables southward of Mys Dzharylgachskiy, and marks the northern side of the entrance channel.

The coastal bank fringing Mys Dzharylgachskiy extends as much as  $1\frac{1}{2}$  miles northward of that point. A spar buoy, painted red and white and surmounted by two cones, points together, is moored about one mile north-north-eastward of Mys Dzharylgachskiy and marks the north-eastern extremity of this bank. 35

A light-buoy, painted white and exhibiting a *white flashing* light, showing a *short flash every five seconds*, with a white spar buoy surmounted by a black cone, point up, close to it, is moored about 2 miles northward of Mys Dzharylgachskiy. 40

**Dzharylgachskiy zaliv.**—**Dangers.**—**Buoyage.**—**Anchorage.**—Dzharylgachskiy zaliv (Dzharylgatskiy liman) is entered between Mys Dzharylgachskiy and the eastern entrance point of Karzhinskiy zaliv, about 6 miles north-north-westward. That part of the bay lying westward of a position about 8 miles westward of the entrance, is very shallow. 45

A flat, with depths of less than 18 feet (5m5), extends as much as one mile northward from the northern side of the eastern part of Ostrov Dzharylgach, and from about one mile to  $1\frac{1}{2}$  miles southward from the northern side of the bay. The outer edge of this flat is steep-to and should be approached with caution. On the southern side of the bay, the outer edge of the flat is marked by a light-buoy, painted white and exhibiting a *white flashing* light, showing a *short flash every five seconds*, with a white spar buoy surmounted by a black cone, point up, close to it, moored about 6 miles west-north-westward of Mys Dzharylgachskiy. 50 55



*Chart 2232.*

On the northern side of the bay, the outer edge of the flat is marked by two red spar buoys, each surmounted by a cone, point down, moored about  $4\frac{1}{2}$  miles westward, and about 7 miles west-north-westward, respectively, of Mys Dzharylgachskiy.

The whole of the bottom of Dzharylgachskiy zaliv, except the coastal bank fringing Ostrov Dzharylgach, is covered with weed, which attains great length after mid-summer and reaches the surface in the shoaler parts of the bay. Owing to the absence of weed over this coastal bank there is a marked contrast in the colours of the water, which is light over the bank, but dark in the greater depths. When fully grown, this weed washes up on the shores of the bay in great masses which rot and give off an offensive smell. This also applies to all the inner part of Karkinitzskiy zaliv eastward of Ostrov Dzharylgach.

The eastern part of this bay provides good anchorage, in depths of from 24 to 30 feet (7m3 to 9m1), for vessels of moderate draught seeking shelter from westerly or southerly winds.

Vessels approaching the port of Skadovsk should use the prescribed anchorage which lies westward of the dredged channel to the harbour, see below, and between three-quarters of a mile and  $2\frac{1}{2}$  miles southward of the western end of the town of Skadovsk, in depths of from 13 to 25 feet (4m0 to 7m6).

**Port of Skadovsk.—Navigational aids.**—There is a small harbour at Skadovsk ( $46^{\circ} 06' N.$ ,  $32^{\circ} 55' E.$ ) consisting of a basin with depths of 25 feet (7m6), protected from southward and eastward by a breakwater about  $1\frac{1}{2}$  cables in length, and from westward by Passazhirskaia pier, which is about half a cable in length. Two vessels, each 375 feet (114m3) in length, can be berthed alongside at the same time. No lighters or tugs are available.

The harbour is approached by a channel about one mile long and 131 feet (40m0) wide, with a least depth in 1958, of  $15\frac{1}{2}$  feet (4m8). The width of the channel narrows to about 100 feet (30m5) for the inner cable of its length.

This channel is marked by spar buoys in accordance with the systems described on page 22, and also by a light-buoy, painted black and exhibiting a *white flashing light every three seconds*, moored on the eastern side of its southern end.

Leading light-beacons have been established for this channel. The front light is exhibited, at an elevation of 37 feet (11m3), from a white framework structure with two vertical stripes, surmounted by a red triangle, point up, 30 feet (9m1) in height, situated on the shore at the head of the channel; the rear light is exhibited, at an elevation of 59 feet (18m0), from a white, iron column with a black vertical stripe, surmounted by a triangle, point down, 52 feet (15m8) in height, situated about  $1\frac{1}{2}$  cables northward of the front light. These lights in line, bearing  $012^{\circ}$ , lead through the channel into the harbour.

**Skadovsk.—Storm signals.—Port facilities.**—The town of Skadovsk had, in 1937, a constant population of about 4,000, but this was greatly increased during the summer. There are two hospitals in the town.

Storm signals, see page 18, are displayed from a mast on the western side of the harbour entrance.

Small quantities of coal can be obtained. Limited supplies of fresh provisions are available. Drinking water can be obtained from a reservoir on Passazhirskaia pier.

There is regular and frequent communication with other Black sea

**Chart 2232.**

ports. During winter, this communication may be interrupted by ice in Karkinitzkiy zaliv.

**Pilotage.**—There is a pilotage station at Skadovsk, *see* pages 260, 261.

**Northern shore of inner part of Karkinitzkiy zaliv.**—**Dangers.**—  
Karzhiński zaliv and Kalanchakski zaliv are entered between the northern entrance point of Dzharlygachski zaliv and the southern extremity of Karabayskaya kosa, a sandy peninsula about  $7\frac{1}{2}$  miles eastward. Poluostrov Domuzgla lies between Kalanchakski zaliv and Perekopski zaliv, about 14 miles east-south-eastward, with Karabayskaya kosa and Poluostrov Gor'kiy Kut extending southward from its south-western side, and Churyumskaya kosa and Adamanskaya kosa extending south-eastward from its south-eastern side. The whole of this stretch of coast is fronted by an extensive flat, and in many places, landing is impossible. The only good landmark is the southern end of Poluostrov Gor'kiy Kut, which is high and rises from the sea in yellow cliffs which can be identified from a distance of about 8 miles, and terminates south-westward in Mys Khorly ( $46^{\circ} 05' N.$ ,  $33^{\circ} 17' E.$ ). The port of Khorly is situated at the southern end of Poluostrov Gor'kiy Kut.

**Approaches to Port Khorly.**—**Dangers.**—**Buoyage.**—**Anchorage.**—Ostrov Kalanchak lies about  $1\frac{1}{2}$  miles southward of the southern extremity of Karabayskaya kosa. Kalanchakskaya banka, a long, sandy bank, which dries in places, extends about  $3\frac{1}{2}$  miles south-eastward from Ostrov Kalanchak; its south-eastern extremity is marked by Kalanchakski light-buoy, painted red and exhibiting a *red flashing light every three seconds*, with a red spar buoy surmounted by a cone, point down, close to it.

Churyumskaya banka extends about 7 miles south-eastward from a position about half a mile southward of the south-eastern extremity of Kalanchakskaya banka. There are depths of from 9 to 12 feet (2m7 to 3m7) over its northern part and a least depth of 3 feet (0m9) over its southern part. The south-western side of this shoal is marked by two black and white spar buoys, each surmounted by two black cones, bases together, and its south-eastern extremity is marked by a red conical buoy with a red spar buoy, surmounted by a cone, point down, close to it.

The area south-westward of Kalanchakskaya banka and Churyumskaya banka is known as Vneshniy Khorlovski rey or Outer Khorly road, and the deeper part of that area lying between these two banks and the coastal flat fronting Poluostrov Domuzgla, as Vnutrenniy Khorlovski rey or Inner Khorly road. Vessels approaching Port Khorly should use the prescribed anchorage in Vneshniy Khorlovski rey; this anchorage is rectangular in shape, with its north-western corner in a position bearing  $088^{\circ}$  from Dzharlygachski lighthouse, distant  $4\frac{1}{2}$  miles, and extends 14 cables in an  $082^{\circ}$  direction, and 12 cables in a  $172^{\circ}$  direction.

**Khorlovski kanal.**—**Buoyage.**—**Depths.**—**Beacon.**—Khorlovski kanal, the channel leading to Port Khorly, consists of two parts, the sea reach and the harbour reach. The sea reach commences about  $5\frac{1}{2}$  miles eastward of Mys Dzharlygachski and leads between Kalanchakskaya banka and Churyumskaya banka in an  $083^{\circ}$  direction for about  $1\frac{1}{2}$  miles, and thence in a  $108^{\circ}$  direction for about three-quarters of a mile into Vnutrenniy Khorlovski rey. This reach is 105 feet (32m0) wide, and, in 1947, had a least depth of 21 feet (6m4). Khorlovski light-buoy, painted black and exhibiting a *white flashing light every three seconds*, is moored on the southern side of the western entrance to the reach, and

*Chart 2232.*

Kalanchakskiy light-buoy, *see* above, marks the south-eastern extremity of Kalanchakskaya banka.

- The harbour reach has been dredged through the coastal bank from  
 5 Vnutrenniy Khorlovskiy reydy to Port Khorly ( $46^{\circ} 05' N.$ ,  $33^{\circ} 18' E.$ ). It is about 2 miles long and 105 feet (32m0) wide, and, at the harbour end, has been widened to a width of 175 feet (53m3). In 1947, there was a least depth of 11 feet (3m4) in this reach.

- Both reaches of Khorlovskiy kanal are marked by spar buoys in accordance with the systems described on pages 22–24, but some of these spar buoys do not carry topmarks.

A beacon, consisting of a white, rectangular shield with a black, vertical stripe, 15 feet (4m6) in height, stands at the foot of the cliff at the head of the dredged channel.

- 15 **Port Khorly.—Port facilities.**—The harbour of Port Khorly consists of a basin 1,050 feet (304m8) in length in a northerly and southerly direction, and 700 feet (213m4) wide, with depths in 1938, of 22 feet (6m7). It is protected on the western side by an earthen dyke, about 500 feet (152m4) in length, which extends southward from the western  
 20 end of a wharf. There are wooden wharves 350 feet (106m7) and 231 feet (70m4) in length on the western and eastern sides, respectively, of the basin.

- The town of Khorly, with a population, in 1938, of about 2,000, stands on high ground immediately northward of the harbour. It is an  
 25 agricultural centre, the chief export being grain. There is a hospital in the town.

There are no lighters or cranes in the port. Small quantities of provisions may be obtained. Fresh water can be supplied from an artesian well.

- 30 There is frequent and regular sea communication with Skadovsk and Odessa, but this communication may be interrupted in winter by ice.  
**Pilotage.**—*See* pages 260, 261.

- Perekopskiy zaliv.**—Perekopskiy zaliv (Perekopskaya bukhta) is entered between Mys Dzhaldykhan, about  $6\frac{1}{2}$  miles east-south-eastward  
 35 of Mys Khorly, and Mys Kartkazak, about  $9\frac{1}{2}$  miles farther east-south-eastward. It is shallow and is not navigable, and in autumn, when easterly and north-easterly winds prevail, large areas of it occasionally dry.

- Southern shore of inner part of Karkinitskiy zaliv.**—From the eastern side of the root of Bakal'skaya kosa (page 26), the southern  
 40 shore of the inner part of the bay trends east-north-eastward for about 20 miles to Mys Kartkazak. This stretch of coast is low and flat and the shorebank fronting it extends about 2 miles off its western part and as much as  $4\frac{1}{2}$  miles off Mys Kartkazak.

- Bakal'skaya bukhta.—Anchorage.—Beacons.**—Bakal'skaya bukhta, on the eastern side of Bakal'skaya kosa, affords secure anchorage well sheltered from westerly and south-westerly winds, in depths of from  
 45 23 to 29 feet (7m0 to 8m8). Northerly winds send in a heavy sea, but little sea is raised by winds from north-eastward. The bottom throughout the anchorage is composed of shells.

- 50 Two channels lead into Bakal'skaya bukhta. The southern channel through Bakal'skaya banka, is described on page 260. The northern channel lies between Bakal'skiy light-buoy (page 261) and the two spar buoys marking the south-western side of Churyumskaya banka (page 263).

- A pier, with a depth of 7 feet (2m1) alongside, lies near the ruins of the  
 55 old Bakal'skiy coastguard station, about 4 miles south-south-westward of Mys Kyn Murun.

*Chart 2232.*

Leading beacons have been established near Bakal'skiy old coast-guard station. The front beacon consists of a black framework shield with a white vertical stripe, surmounted by a black triangle, point down, 28 feet (8m5) in height; the rear beacon consists of a similar shield, surmounted by a white diamond, 46 feet (14m0) in height. These beacons in line, bearing  $173\frac{1}{2}^{\circ}$ , lead through the channel between Bakal'skaya banka and Churyumskaya banka and to the anchorage and pier. At night, the *white* sector of Dzhar'lgachskiy light, between the bearings of  $295^{\circ}$  and  $304^{\circ}$ , leads through the channel.

**Sary-Bulat and approach.—Anchorage.—Beacons.**—The village of Sary-Bulat stands on a low, sandy point of the same name about  $13\frac{1}{4}$  miles eastward of Mys Kyn Murun ( $45^{\circ} 48' N.$ ,  $33^{\circ} 11' E.$ ). In the vicinity are several white stone barns and the prominent white church of the old Sary-Bulat monastery, mentioned on page 260.

Vessels proceeding to Sary-Bulat should anchor within an area extending from 3 to 12 cables offshore, bounded on the north-east by a line drawn in a  $297^{\circ}$  direction from the point on which is the village, and on the south-west, by a line drawn parallel at a distance of  $1\frac{1}{4}$  miles.

Leading beacons have been established for the anchorage off Sary-Bulat. The front beacon consists of a black, rectangular framework shield with a white vertical central stripe, surmounted by a triangle, point up, 23 feet (7m0) in height, the rear beacon, consists of a similar structure, surmounted by a triangle, point down, 33 feet (10m1) in height. These beacons in line with each other and with the white wall and belfry of the old monastery church, bearing  $115\frac{1}{2}^{\circ}$ , lead to the anchorage and to a pier, now destroyed.

Sary-Bulatskiye ostrova, a group of low and marshy islands, extend about  $2\frac{1}{4}$  miles east-north-eastward of the old monastery.

There is a small pier with a depth of 7 feet (2m1) off its head, at Tobiz, about 4 miles west-south-westward of Sary-Bulat.

*Chart 2214.*

**THE CRIMEA.—General remarks.**—The Crimea is a peninsula connected with the mainland northward by an isthmus about 20 miles long and 5 miles wide near the village of Perekop ( $46^{\circ} 10' N.$ ,  $33^{\circ} 42' E.$ ) (page 260). It is bounded on three sides by the Black sea and on its fourth, or north-eastern side, by the Sea of Azov, and it terminates eastward at the western shore of Kerchenskiy proliv.

The north-eastern part of the Crimea is a steppe without hills or trees, but its southern part is completely different, being composed of mountains of considerable elevation with many fertile valleys.

The north-western coast is described with Karkinititskiy zaliv on pages 255-260.

*Charts 2232, 2233.*

**SOUTH-WESTERN COAST OF THE CRIMEA.—Mys Tarkhankut to Mys Yevpatoriyskiy.—Dangers.—Navigational aids.**—From Mys Tarkhankut ( $45^{\circ} 21' N.$ ,  $32^{\circ} 30' E.$ ) (page 255) the south-western coast of the Crimea trends eastward for about 8 miles to Mys Uret and becomes higher and steeper. Mys Uret can easily be identified by the village of Oyret (Oiret), in which is a minaret and a number of windmills standing on the summit of the point, and also by some above-water rocks very close southward of it. This stretch of coast is steep-to and may be safely approached to a distance of half a mile offshore.

From Mys Uret the coast trends north-eastward for about 4 miles

*Charts 2232, 2233.*

and continues high and steep; thence it trends eastward and becomes gradually lower for about 7 miles to the western end of Ozero Donuzlav, which is salt. This stretch of coast is also clear of dangers and may be  
 5 approached to a distance of about one mile. The village of Chokrak (Chekrak) which, with an orchard, stands in a hollow in the hills about 2 miles inland and about 6 miles north-eastward of Mys Uret, and Tok-Sheykh, another village, which stands on a hill about  $1\frac{1}{2}$  miles northward of the western end of Ozero Donuzlav, are both good land-  
 10 marks.

Terekly-As (Terekli-As), a village on the northern shore of Ozero Donuzlav, is visible over the low, narrow beach separating that lake from the sea, and, from an offing, appears to stand on the shore of a bay extending far inland.

15 The coastal hills recede inland on the northern side of Ozero Donuzlav, and between its western end and Mys Yevpatoriyskiy (Eupatoria), about 20 miles south-eastward, the coast becomes low and sandy and, in some places, is so low that it can hardly be distinguished from 2 miles offshore; within it, besides Ozero Donuzlav, are several other salt lakes which  
 20 are separated from the sea by narrow strips of sand. There are some sand dunes on the coast near Mys Yevpatoriyskiy. The village of Oyarcha (Aircha), situated near the coast about  $6\frac{1}{2}$  miles north-westward of Mys Yevpatoriyskiy, is the only prominent landmark on this stretch of coast.

Between the villages of Terekly-As and Oyarcha, the coast is steep-to  
 25 and can be safely approached to a distance of one mile, but from abreast the latter village to Mys Yevpatoriyskiy, the coastal bank extends some distance offshore and this latter stretch of coast should not be approached within a distance of 2 miles.

A bank with depths of less than 30 feet (9m1) extends about 2 miles  
 30 south-westward, and one mile southward from Mys Yevpatoriyskiy ( $45^{\circ} 09' N.$ ,  $33^{\circ} 16' E.$ ). Near its south-western extremity are two rocks, with depths of 35 and 31 feet (10m7 and 9m4), respectively, over them; a spar buoy, painted red and surmounted by a red cone, point down, marks the extremity of the bank.

35 Popovka light is exhibited, at an elevation of 60 feet (18m3), from a white, two-sided shield with a black, vertical stripe, 32 feet (9m8) in height, situated on the coast near the village of Popovka, about  $13\frac{1}{2}$  miles north-westward of Mys Yevpatoriyskiy.

Yevpatoriyskiy light is exhibited, at an elevation of 53 feet (16m2),  
 40 from a white, circular tower, 46 feet (14m0) in height, situated close within the extremity of Mys Yevpatoriyskiy. A radiobeacon transmits from the lighthouse.

**Prohibited fishing areas.—Prohibited anchorage.**—Fishing is prohibited in an area bounded by the following points:—From a position about  
 45  $3\frac{1}{2}$  miles south-eastward of Tarkhankut in a southerly direction for about 5 miles; thence east-south-eastward for about 13 miles; thence northward for about 8 miles; thence west-north-westward for about 4 miles; thence west-south-westward for about the same distance; thence southward for about 2 miles and thence west-north-westward to the  
 50 point of origin.

Fishing is prohibited in an area  $7\frac{1}{2}$  miles square, the north-eastern corner of which lies 10 miles south-westward of Mys Yevpatoriyskiy.

A small area in which anchoring and fishing are prohibited lies within about one mile south-eastward of Mys Yevpatoriyskiy; these areas are  
 55 not indicated on the chart.

## Chart 2233.

**Kalamitskiy zaliv.—Aspect.—Navigational aids.—Dangers.**—Kalamitskiy zaliv is entered between Mys Yevpatoriyskiy and Mys Lukull, about 22 miles south-eastward. The northern shore of the bay is low and sandy and, from Mys Yevpatoriyskiy trends east-north-eastward for about 5 miles to Mys Karantinnyy (Karantinni). Eastward of the former point is a bight within the shore of which is Ozero Maynakskoye, which is salt; between this lake and Mys Karantinnyy the coast is lined with villas. 5

A light is exhibited, at an elevation of 30 feet (9m1), from a white, iron turret with a red vertical stripe, on a white framework structure, 28 feet (8m5) in height, situated on Mys Karantinnyy. A fog signal is sounded from the light-structure. 10

A bank with depths of less than 18 feet (5m5) extends as much as half a mile off the northern shore of Kalamitskiy zaliv. There are numerous sunken rocks, with depths of from 10 to 20 feet (3m0 to 6m1) over them, near the outer edge of this bank between Ozero Maynakskoye and Mys Karantinnyy. A spar buoy, painted red and white and surmounted by two red cones, points together, marks the outer edge of this bank about 5½ cables south-eastward of Mys Karantinnyy (45° 11' N., 33° 22' E.). 15 20

Yevpatoriyskaya bukhta is entered eastward of Mys Karantinnyy, in the northern corner of Kalamitskiy zaliv. The town of Yevpatoriya (Eupatoria) is situated on the northern shore of the bay. From an offing all the more prominent landmarks are situated in the town and are described on page 268. 25

The eastern shore of Kalamitskiy zaliv is at first low and sandy and within it are several salt lakes. Of these, Ozero Sasyk (Eupatoria) lies close within the north-eastern ashore of the bay, between the town of Yevpatoriya and a position about 6 miles east-south-eastward. Three smaller lakes, named Sakskoye (Sakscoe), Kizil-Yar and Kichik-bel', lie close within the eastern shore, about 1½, 5 and 8½ miles, respectively, south-south-eastward of Ozero Sasyk. 30

A light is exhibited, at an elevation of 49 feet (14m9), from a white, wooden framework structure with a black, vertical stripe, 26 feet (7m9) in height, situated on the coast about a quarter of a mile south-south-westward of Ozero Kizil-Yar. 35

On the coast near the north-western end of Ozero Sakskoye, about 7 miles east-south-eastward of Mys Karantinnyy, is the prominent, two-storeyed building of a saltworks with two tall chimneys and several other buildings nearby. 40

A shoal spit, composed of hard sand mixed with stiff, muddy clay, with depths of from 12 to 21 feet (3m7 to 6m4), extends as much as 1½ miles offshore, about 9½ miles south-south-eastward of the saltworks.

A rocky ridge, consisting of slabs of laminated rock, with depths of from 30 to 40 feet (9m1 to 12m2), and varying in width from about half a cable to 2 cables, lies parallel with, and from 3 to 3½ miles off the eastern shore of Kalamitskiy zaliv, between positions about 2½ miles southward, and 12½ miles south-south-eastward of Mys Karantinnyy. The least depth of 29 feet (8m8), is over a patch near its southern end, which is separated from the main ridge by depths of about 66 feet (20m1). This ridge rises abruptly from depths of about 60 to 66 feet (18m3 to 20m1). 45 50

A 34-foot (10m4) patch lies about 2 miles south-westward of the saltworks, and some shoals, composed of stones and stiff clay, lie about 1½ miles offshore between Ozero Kizil-Yar and Ozero Kichik-bel'. 55

Between Ozero Kichik-bel' and Mys Lukull, about 11 miles south-

*Chart 2233.*

ward, the coast becomes steep and reddish and its southern part, which is the higher, is intersected by two valleys; Zamrukskaya balka, through which Reka Bulganak flows into the sea near the village of Beregovoye  
 5 (Zamruk), and Balka Kurdzhelga, about 5 and 3 miles, respectively, north-eastward of Mys Lukull. Southward of the latter valley, the coast slopes down to the valley of Reka Alma, a small river which enters the sea about  $1\frac{1}{2}$  miles eastward of Mys Lukull. The mouth of Reka  
 10 Alma may be identified by its northern entrance point which is reddish and rounded, and by the green orchard and gardens along the river banks. Foul ground extends about  $1\frac{1}{2}$  miles offshore near the mouth of Reka Bulganak.

Between the mouth of Reka Alma and Mys Lukull ( $44^{\circ} 50' N.$ ,  $33^{\circ} 33' E.$ ) there is a bight which affords good anchorage for small craft  
 15 on a sandy bottom, with shelter from all but north-westerly winds. The only convenient landing place here is at the mouth of Orta-Kisekskaya balka at the head of the bight, as the coast on either side consists of inaccessible cliffs, fringed by above-water and sunken rocks. Depths of 18 feet (5m5) extend as much as 4 cables off the shores of the bight but  
 20 farther offshore the depths increase gradually, the bottom being mud over a layer of sand and shell.

Mys Lukull is a remarkable headland of crumbling formation which rises to an elevation of about 120 feet (36m6) about half a mile south-westward. On the southern side of the cape is a prominent white building.  
 25 Mys Lukull is fringed by foul ground which extends about one mile offshore. A rock (Lukul rock), with depths of 16 to 18 feet (4m9 to 5m5) over it, lies about half a mile north-westward of the cape.

Lukul'skiy light is exhibited, at an elevation of 127 feet (38m7), from a red, iron framework structure, 60 feet (18m3) in height, surmounted by  
 30 a white, square daymark with a black vertical stripe, situated about half a mile south-eastward of the extremity of Mys Lukull.

**Prohibited area.—Caution.**—Without permission, navigation is prohibited within distances of from 3 to 11 miles of the coast between the parallels of latitude  $45^{\circ} 06\frac{1}{2}' N.$  and  $44^{\circ} 23' N.$  Changes in navigational  
 35 aids within this area will not ordinarily be announced by Notices to Mariners. Attention is drawn to "*LAWS AND REGULATIONS APPERTAINING TO NAVIGATION*" on page 1.

**Current.**—A number of observations, made in 1911, tended to show that, seaward of the rocky ridge, described above, there was a constant  
 40 north-easterly current which was perceptible over the whole of the entrance to Kalamitskiy zaliv. This current deviated at times one or two points from this direction.

Russian oceanographical observations, made between July and November, 1925, indicate that the currents off Yevpatoriya vary with  
 45 the wind. During a south-westerly wind, force 2-3, a weak north-easterly current set past Mys Karantinny and clockwise round Yevpatoriyskaya bukhta, but during a wind of similar force in the opposite direction, this current was reversed.

**Yevpatoriyskaya bukhta.—Landmarks.**—From an offing, the most  
 50 prominent landmarks in the town of Yevpatoriya (Eupatoria) are the cathedral with a grey dome, situated near the coast, and a domed mosque, built in the Byzantine style, a short distance westward of it.

**Pilotage.**—Pilotage is compulsory for merchant vessels.

**Anchoragees.—Navigational aids.**—Anchorage can be obtained, in  
 55 depths of from 30 to 33 feet (9m1 to 10m1), east-south-eastward of Mys Karantinny and southward of some windmills situated eastward of the

**Chart 2233.**

town. This anchorage is open from south-east to west-south-west, but south-easterly and southerly winds, even when fresh, do not raise very much sea as some protection is afforded by the coast southward.

Small vessels anchor near the town, in from 15 to 18 feet (4m6 to 5m5), between Kabotazhnyy mol and Mys Karantinnyy, the bank off the latter affording some shelter from the sea which sets in with south-westerly winds and sometimes renders the anchorage unsafe. Easterly winds sometimes cause a choppy sea in this anchorage, which hinders working cargo.

The eastern side of Mys Karantinnyy is stated to be gradually extending, due to wind action, and the depths in the roadstead to be gradually decreasing. The nature of the bottom is everywhere sand, but in many places this is only a thin layer over rock.

A light is exhibited, at an elevation of 11 feet (3m4), from a post at the head of a pier situated about  $1\frac{1}{2}$  cables northward of Mys Karantinnyy ( $45^{\circ} 11' N.$ ,  $33^{\circ} 22' E.$ ).

A conical buoy, painted green, is moored about  $3\frac{1}{2}$  cables north-eastward of Mys Karantinnyy.

A spar buoy, painted red and surmounted by a cross, is moored about  $1\frac{1}{2}$  cables eastward of Mys Karantinnyy. The spar buoy marking the extremity of the bank extending south-eastward from Mys Karantinnyy is described on page 267.

**Harbour regulations.**—The following regulations are in force in addition to those given on page 15:—

- (1) Vessels must not anchor between the green conical buoy and the pier about  $2\frac{1}{2}$  cables north-westward.
- (2) Foreign vessels placed in quarantine must anchor off the spar buoy south-eastward of Mys Karantinnyy.
- (3) As the holding ground is mostly rock covered with a thin layer of sand, vessels should ride with a scope of cable of at least three times the depth.
- (4) Vessels will be berthed by the Harbour Authority.

**Water level.**—The water level in the roadstead is affected by the prevailing winds, the range amounting to  $2\frac{3}{4}$  feet (0m8). North-easterly winds lower the level and south-westerly winds raise it. The level is highest from April to August and lowest in November and December.

**Town.**—**Port facilities.**—**Radio station.**—The town of Yevpatoriya, with a population, in 1938, of about 27,000, is situated on an arid plain. It is a summer health resort. The principal exports are salt, grain and wool.

There are several piers in Yevpatoriyskaya bukhta, of which Kabotazhnyy mol or Coasting Trade pier and the Commercial Port Authorities' pier are in the western part, and the piers of a petroleum syndicate and a saltworks in the eastern part. There are depths of from 10 to 14 feet (3m0 to 4m3) alongside the westernmost piers and lesser depths alongside the others.

Limited quantities of meat, poultry and vegetables can be obtained. Water is laid on to the western piers.

There is regular sea communication with other U.S.S.R. Black sea ports except when interrupted by bad weather.

**Life-saving.**—**Storm signals.**—There is a life-saving station, with a lifeboat, on the western side of the bay.

Storm signals, *see* page 18, are displayed from a mast situated on the northern side of the bay.

**Winds.**—During winter north-easterly winds prevail. In summer there is generally a south-westerly sea breeze during the day.



*Chart 2233.*

Gales are most frequent from north-eastward; south-westerly gales are rare. The former often commence with heavy squalls coming down the valleys within the town.

- 5 **Fog.**—Fog occurs occasionally between November and April. It generally develops at night and clears soon after sunrise.

- Anchorage and piers in Kalamitskiy zaliv.**—**Buoys.**—South-eastward of Yevpatoriya there are three piers used by lighters serving vessels which anchor in depths of from about 36 to 40 feet (11m0 to 12m3)  
10 from about three-quarters to one mile offshore. Small vessels can load alongside the middle pier. Two red barrel buoys, moored about 2 miles eastward, and 4 miles east-south-eastward, respectively, of Mys Karantinnyy, mark this anchorage, which, though protected somewhat by the rocky ridge described on page 267, is dangerous during south-westerly  
15 and westerly winds.

- Mys Lukull to Konstantinovskiy mys.**—**Light.**—**Dangers.**—**Buoys.**—From Mys Lukull (44° 50' N., 33° 33' E.) the coast trends south-south-westward for about 3 miles to Mys Margopulo (Lukul bluff) and thence southward for about 9½ miles to Severnaya kosa (North  
20 point), the western extremity of Konstantinovskiy mys, the headland forming the northern side of the entrance to Sevastopol'skaya bukhta (Sevastopol harbour). This stretch of coast is cliffy and reddish in colour and is intersected by the valleys of Reka Kacha and Reka Bel'bek, which flow into the sea about 4 and 7½ miles, respectively, southward of  
25 Mys Margopulo. The mouth of Reka Kacha can be identified by a white, triangular sandpatch on its southern side, and also by a red-roofed house on its northern bank. The mouth of Reka Bel'bek may be distinguished by a large orchard close within it.

- A light is exhibited, at an elevation of 92 feet (28m0), from a white  
30 shield with a black, vertical stripe, 25 feet (7m6) in height, situated on Mys Margopulo.

Three mooring buoys are laid 17½ miles westward of Mys Margopulo.

- Between Mys Lukull and the mouth of Reka Kacha, the depths are very irregular for about one mile offshore, with many detached sunken  
35 rocks with depths of from 16 to 30 feet (4m9 to 9m1) over them. The outermost of these rocks, with depths of 27 feet (8m2) over it, lies about 11 cables south-westward of Mys Margopulo and about 9 cables offshore. These dangers are marked by two black and white spar buoys, each surmounted by two cones, bases together, moored, respectively, about  
40 one mile westward of Mys Margopulo, and about 2½ miles southward of the same point and 6½ cables offshore.

**APPROACHES TO SEVASTOPOL'SKAYA BUKHTA.—Aspect.**—

- Sevastopol'skaya bukhta (Sevastopol harbour) is entered between Konstantinovskaya kosa, the southern extremity of Konstantinovskiy mys,  
45 about 3 cables south-south-eastward of Severnaya kosa, and Mys Aleksandrovskiy (Alexander), about half a mile southward.

- The southern coast of the Crimea terminates westward in a low shelving peninsula, the extremity of which is Mys Khersones (Khersonese)  
50 (44° 35' N., 33° 23' E.). From this cape the northern side of the peninsula trends east-north-eastward for about 6 miles to Mys Aleksandrovskiy. This stretch of coast rises gradually to a moderate elevation and becomes rocky; it is deeply indented by several bays. See views [12] and [13].

- Vessels approaching Sevastopol'skaya bukhta from northward will  
55 sight the town of Sevastopol' simultaneously with Khersonesskiy light-structure. On a closer approach, the buildings on the heights on the

*Chart 2233.*

northern side of Sevastopol'skaya bukhta will be seen, the church in Bratskoye cemetery, about 2 miles east-north-eastward of Konstantinovskaya kosa, which resembles a large, four-sided pyramid, being especially prominent. Then the following buildings on the southern side of the harbour will be seen:—The chapel in the Orthodox cemetery, about one mile southward of Mys Aleksandrovskiy; Khersonesskiy museum (Khersonese monastery), about three-quarters of a mile west-south-westward of Mys Aleksandrovskiy; the cathedral (St. Vladimir church) which is similar in appearance to the museum, about three-quarters of a mile south-eastward of Mys Aleksandrovskiy; the buildings in the higher part of the town; and, finally, the disused Konstantinovskaya fort, situated on Konstantinovskaya kosa.

Vessels approaching from north-westward will first sight Chatyr Dag, see page 287, and then the south-western coast of the Crimea, Mys Ayya (Aiya), about 15 miles south-eastward of Mys Khersones, with its almost precipitous cliff, being especially prominent. Khersonesskiy light-structure will then be sighted and afterwards, the reddish coast on the northern side of the harbour entrance and the buildings in the town.

To vessels approaching from south-westward the land presents a distinctive appearance with three remarkable capes or headlands. Mys Ayya, the southernmost of these capes, appears first as a high, bold cliff; Mys Feolent, the central cape, about 7 miles south-eastward of Mys Khersones, is moderately high and has three notches, resembling steps, on it, and between it and Mys Ayya is Balaklavskaya (Balaklava) bukhta; the north-westernmost cape, Mys Khersones itself, is long and low and may be readily recognised by the light-structure on it. The grey framework mast of a wind gauge, situated on the heights, about  $2\frac{1}{2}$  miles east-north-eastward of Mys Feolent, is a good mark. See views [14] to [18] and Appendix III.

*Chart 2232.*

**Off-lying danger.**—An obstruction, dangerous to navigation, lies 33 miles west-north-westward of Mys Khersones.

*Chart 2233.*

**Prohibited area.—Caution.**—For the area in which navigation without permission is prohibited, see page 268.

**Konstantinovskiy mys.—Dangers.—Buoyage.**—The western end of Konstantinovskiy mys is fringed by a rocky bank with depths of less than 30 feet (9m1), which extends about half a mile westward from Severnaya kosa and about one cable southward from Konstantinovskaya kosa.

A light-and-whistle buoy, painted in black and white vertical stripes and exhibiting a *white flashing* light every three seconds, with a black and white spar buoy surmounted by two cones, bases together, moored close to it marks the western extremity of this bank, and two red spar buoys, each surmounted by a cone, point down, mark its southern side.

Two detached 36-foot (11m0) patches lie, respectively, about 9 cables west-south-westward, and a similar distance westward of Konstantinovskaya kosa.

A white watch-house with a red-tiled roof, situated on the southern side of the harbour near the summit of a 273-foot (83m2) hill (Mount Rudolf), about  $1\frac{1}{2}$  miles southward of Mys Aleksandrovskiy ( $44^{\circ} 37' N.$ ,  $33^{\circ} 31' E.$ ), bearing  $163^{\circ}$  and in line with the chapel of the Orthodox cemetery about half a mile north-north-westward of the watch-house, leads between the western extremity of the bank off Konstantinovskiy mys and the two 36-foot (11m0) patches mentioned above. Deep-draught

*Chart 2233.*

vessels should not use this leading line as it leads over irregular depths, but should approach the harbour entrance on the line of Inkermanakiye leading lights, *see* page 274.

- 5 **Mys Khersones.—Navigational aids.—Dangers.**—Khersonesskiy light is exhibited, at an elevation of 111 feet (33m8), from a white round masonry tower, 118 feet (36m0) in height, situated about 2 cables south-eastward of the extremity of Mys Khersones. A radiobeacon transmits from the light-structure.

- 10 Mys Khersones is fringed by a bank with depths of less than 30 feet (9m1) which extends about 2 cables westward and 2½ cables south-westward from it. A spar buoy, painted black and white and surmounted by two cones, bases together, marks the western side of the bank.

- Vessels rounding Mys Khersones from southward should keep Mys  
15 Feolent, *see* page 271, bearing 134° and open south-westward of a lower bluff (Cossack point), situated about 1½ miles south-south-eastward of Mys Khersones, until Konstantinovskaya old fort is seen to bear 070° and is well open of the northern coast of the peninsula. The church in Bratskoye cemetery, bearing 074° and in line with the northern edge

- 20 of Konstantinovskaya old fort, leads northward of all dangers off the northern side of the peninsula.

**Anchorage.**—There is good anchorage during offshore winds, southward of Mys Khersones, but *see* prohibited area on page 266.

- Prohibited anchoring and fishing area.**—Anchoring and fishing  
25 are prohibited in an area bounded by the following points:—From a position about 5 cables north-eastward of Mys Khersones in a north-north-westerly direction for about 8 miles; thence south-westward for about 5½ miles; thence south-south-eastward for about 9 miles and thence north-eastward to the shore. Attention is drawn to "**LAWS AND**  
30 **REGULATIONS APPERTAINING TO NAVIGATION**" on page 1.

- Dvoynaya bukhta.—Dangers.—Buoys.—Anchorages.**—Dvoynaya bukhta is entered between a point about one mile east-north-eastward of Mys Khersones and a point about one mile farther in the same direction.  
35 It is divided by a peninsula into two arms, Kazach'ya (Kazach) bukhta westward, and Kamyshevaya (Kameish) bukhta eastward. Both these arms are exposed to northerly winds, but afford secure anchorage with those offshore, the latter arm being safer and more convenient. In the outer parts of both, the bottom is muddy sand with gravel and shells;  
40 in the inner it is more tenacious.

- The western entrance point of Dvoynaya bukhta is fringed by a bank, with depths of less than 30 feet (9m1), which extends about 2½ cables northward and north-eastward from it; the northern extremity of this bank is marked by a white spar buoy surmounted by a black cone, point  
45 up, and its north-eastern extremity by a red and white spar buoy surmounted by two red cones, points together.

- The eastern entrance point of Dvoynaya bukhta is fringed by a bank, with depths of less than 30 feet (9m1), which extends about 1½ cables offshore in a westerly direction, and about 2½ cables offshore in a  
50 northerly direction. There are some detached rocks, with depths of from 24 to 30 feet (7m3 to 9m1), close off the outer edge of this bank. The western extremity of this bank is marked by a black and white spar buoy surmounted by two black cones, bases together.

- The northern extremity of the peninsula separating Kazach'ya bukhta  
55 and Kamyshevaya bukhta (44° 35' N., 33° 25' E.) is fringed by a bank, with depths of less than 30 feet (9m1), which extends about 2½ cables

*Chart 2233.*

north-north-westward and  $1\frac{1}{2}$  cables north-eastward from it. This bank is marked by a white spar buoy surmounted by a black cone point up, moored close within its northern edge, and by a red and white spar buoy surmounted by two red cones, points together, moored close within its north-eastern edge. 5

Kazach'ya bukhta is again divided into two arms, the western of which is shallow. A bank, with depths of less than 18 feet (5m5), extends about three-quarters of a cable offshore in its outer part, and a sunken rocky ridge, with similar depths over it, extends about  $2\frac{1}{2}$  cables northward from the point between the two arms. 10

The shores of Kamyshevaya bukhta are moderately steep and high and are quite barren. In the outer part of this bay the fringing bank only extends as much as half a cable offshore; the inner part is shallow. There are a few farms near the head of the bay. A patch, with depths of from 22 to 26 feet (6m7 to 7m9) over it, lies in the fairway about  $2\frac{1}{2}$  cables north-eastward of the western entrance point, and a sunken rock, with a depth of 13 feet (4m0) over it, lies about  $1\frac{1}{2}$  cables south-south-eastward of the eastern entrance point and about one cable offshore. 15

Anchorage can be obtained, in depths of about 12 fathoms (21m9), midway between the entrance points of Dvoynaya bukhta. There is good anchorage in Kamyshevaya bukhta, in from 42 to 60 feet (12m8 to 18m3), eastward of the western entrance point, and also, in from 36 to 42 feet (11m0 to 12m8), about 4 cables farther southward; the latter anchorage is more restricted and the coastal bank in the vicinity is steep-to. 25

**Peschanaya bukhta.—Dangers.—Buoy.—Anchorage.**—Peschanaya (Peschana) bukhta is entered between a point about one mile north-eastward of the eastern entrance point of Dvoynaya bukhta and a point about 3 cables eastward. Its shores are lined with villas. Banks, with depths of less than 30 feet (9m1), extend about 2 cables off both entrance points, and foul ground extends some distance offshore on either side of the entrance. A white spar buoy, surmounted by a black cone, point up, marks the outer edge of the bank off the western entrance point. 30

An islet lies on a shallow spit extending from the head of the bay, with foul ground extending about one cable northward from it. 35

Anchorage can be obtained, in depths of from 36 to 60 feet (11m0 to 18m3), off the entrance to this bay.

**Streletskaya bukhta.—Dangers.—Navigational aids.**—Streletskaya (Streletska) bukhta is entered between a point ( $44^{\circ} 37' N.$ ,  $33^{\circ} 28' E.$ ) about one mile east-north-eastward of the eastern entrance point of Peschanaya bukhta and a point about 2 cables eastward. 40

A rocky flat fronts the coast for half a mile westward from the western entrance point and extends about 3 cables offshore; its northern extremity is marked by a white spar buoy surmounted by a cone, point up. Foul ground fringes the western entrance point and the coast for about  $2\frac{1}{2}$  cables southward; its outer edge is marked by two red and white spar buoys, each surmounted by two cones, points together. 45

Foul ground extends from about a half to three-quarters of a cable off the eastern entrance point and from the coast for about one cable on either side of it; its outer edge, westward of the point, is marked by two black and white spar buoys, each surmounted by two cones, bases together. 50

From the western entrance point the western side of the bay trends southward for about 2 cables to a small point on which stand some oil tanks and on the south-eastern side of which there is a small pier. This stretch is high and bluff. Southward of this small point this side of the bay is high and moderately steep. 55

*Chart 2233.*

The outer part of the eastern side of the bay is high and bluff, but it becomes low at the mouth of a gully about half a mile within the entrance; thence to the head of the bay this side is again high but rises in  
5 fairly gentle slopes from the bay.

It was the intention, some years ago, to transfer the commercial port from Yuzhnaya bukhta, in Sevastopol'skaya bukhta, to Streletsкая bukhta, but this idea has been abandoned; some harbour works have been constructed but the port is of little importance.

10 A breakwater, about one cable long, extends westward from the eastern side of the bay and protects a quay, which extends about  $1\frac{1}{2}$  cables south-south-eastward from its outer end. There is a basin southward of the quay, with a small pier on its southern side.

Leading lights have been established for entering Streletsкая bukhta.  
15 The front light is exhibited, at an elevation of 76 feet (23m2), from a black, metal framework mast with a white vertical stripe, 56 feet (17m1) in height, situated close within the western side of the head of the bay; the rear light is exhibited, at an elevation of 109 feet (33m2), from a similar structure, 28 feet (8m5) in height, situated about  $1\frac{1}{2}$  cables southward of the  
20 front light. These lights in line, bearing  $188^\circ$ , lead into the bay.

**Khersonesskaya bukhta.**—Khersonesskaya (Khersonese) bukhta is small and sandy and is entered about half a mile eastward of the eastern entrance point of Streletsкая bukhta; the depths in the bay and the nature of the bottom render anchorage in it inconvenient. A reef extends  
25 about 2 cables northward from its eastern entrance point.

**Karantinnaya bukhta.** — **Dangers.** — **Buoyage.** — Karantinnaya (Quarantine) bukhta is entered about half a mile west-south-westward of Mys Aleksandrovskiy and may be identified by the square tower and spire of Khersonesskiy museum ( $44^\circ 37' N.$ ,  $33^\circ 30' E.$ ) and the other  
30 buildings of that institution, situated on the western side of the entrance.

Karantinnaya bukhta affords shelter to small craft from all winds.

A spit, with depths of less than 18 feet (5m5), extends about 2 cables north-north-eastward from the western entrance point, and a 21-foot (6m4) shoal lies close northward of the northern extremity of the spit;  
35 a light buoy, painted red with white crosses, and exhibiting an *orange flashing* light showing a *short flash every three seconds*, with a spar buoy surmounted by a cross, moored alongside it, marks this 21-foot (6m4) shoal.

The eastern entrance point of the bay is fringed by a bank with depths of less than 18 feet (5m5), which extends about one cable north-westward from its western extremity and about 2 cables northward from its northern extremity; this latter part, on which there is an above-water rock, is marked by a white spar buoy surmounted by a black cone, point up, moored off its northern edge.

**Inkermanskiye leading lights.**—Inkermanskiye (Inkerman) leading  
45 lights are exhibited near the head of Sevastopol'skaya bukhta. Peredniy Inkermanskiy (West Inkerman), the front light, is exhibited, at an elevation of 299 feet (91m1), from a white, square, stone building, 33 feet (10m1) in height, situated on a steep cliff on the northern side of the head of the harbour. Zadniy Inkermanskiy (East Inkerman), the rear  
50 light, is exhibited, at an elevation of 642 feet (195m7), from a similar building situated on a hill about  $1\frac{1}{2}$  miles eastward of the front light.

The cliff on which the front lighthouse stands shows up white and is a good indication of the position of this lighthouse, but the rear lighthouse stands amongst trees and is difficult to identify. Each of these  
55 lighthouses appears as three white houses joined together, with a dark cone over the central house.

*Chart 2233.*

These lights in line, bearing 095°, lead into Sevastopol'skaya bukhta; see Port regulations below.

**SEVASTOPOL'SKAYA BUKHTA.—General remarks.—Aspect.**—Sevastopol'skaya (Sevastopol) bukhta (44° 37' N., 33° 22' E.) is said to be one of the best and safest harbours in the Black sea, and is well-sheltered from southward. Although it is open from west-south-west to west-north-west, from which quarter very strong winds are sometimes experienced the sea then raised is broken considerably by the shoals off the entrance points and the holding ground, which is mud, is so good that well-found vessels can easily ride out such winds. It is accessible to vessels of the deepest draught and the harbour never freezes over. See view [14].

Inkermanskoye ushchel' ye, a ravine extending inland from the head of the harbour, is the deepest of the ravines on the western side of the Crimea. Its chalk cliffs continue along both sides of the harbour to the entrance, and on the southern side, beyond it to Mys Khersones, becoming gradually lower westward. Reka Chernaya flows through Inkermanskoye ushchel' ye into the head of the harbour.

On both sides of the harbour there are projecting headlands forming several indentations, the most extensive of which are on the southern side.

The naval port of Sevastopol' is situated in Yuzhnaya (South) bukhta and Korabel' naya (Dockyard) bukhta. The Commercial port is situated on the western side of Yuzhnaya bukhta, where the jetties and offices of the Commercial Port Authorities are situated, and in Artilleriyskaya bukhta, see page 276, as well as in Streletskaia bukhta (page 273).

Worms which attack wood abound in Sevastopol'skaya bukhta and it is inadvisable to leave unprotected wooden boats in the water for any length of time.

**Port regulations.**—The port is closed to foreign shipping.

Vessels wishing to enter Sevastopol'skaya bukhta must notify the Commander-in-Chief, Sevastopol', seven days before they are due at the port and must obtain permission to enter.

Entry is only allowed between sunrise and sunset; vessels approaching at night must wait either in Laspinskaya bukhta, see page 282, the bight off the mouth of Reka Alma, or off the port in Lat. 44° 38' N., Long. 33° 21' E.

Merchant vessels entering the harbour are to approach only on the line of Inkermanskiye leading lights, described on page 274, from the position Lat. 44° 38' N., Long. 33° 21' E., and when abreast Yuzhnaya bukhta are to proceed to the quay. Should a berth at the quay not be available, small vessels may anchor in Artilleriyskaya bukhta.

No vessel shall discharge overboard any petroleum product or water mixed with petroleum refuse, within an area southward of the parallel of Lat. 44° 38' N., and eastward of the meridian of Long. 33° 23' E.

**Pilotage.**—Pilotage is compulsory for merchant vessels.

**Submarine cables.—Navigational aids.—Caution.**—A number of submarine telegraph and power cables, the positions of which are indicated on the chart, cross Sevastopol'skaya bukhta. The landing places of the cables are each marked by beacons, except on Mys Aleksandrovskiy and the point about 3 cables eastward of it, where they are marked by lights.

Anchorage is prohibited in the vicinity of any of these cables. Should a cable be fouled by a vessel's anchor, the greatest care must be taken not to damage it; the position is to be buoyed and the matter reported immediately to the Harbour Authorities.

*Chart 2233.*

**Entrance.—Boom.—Light-buoya.**—A boom has been placed across the entrance between Konstantinovskaya kosa ( $44^{\circ} 38' N.$ ,  $33^{\circ} 31' E.$ ) and Mys Aleksandrovskiy. A passage above 150 yards (137m2) wide has been  
 5 left for vessels on the line of Inkermanskiye leading lights. The passage is marked on the northern side by a light-buoy, painted red and exhibiting a *white flashing light every two-and-a-half seconds*, and on the southern side by a light-buoy, painted white and exhibiting a *white flashing light every three seconds*.

10 **Western part of Sevastopol'skaya bukhta.—Dangers.—Buoyage.**  
 —The northern side of the harbour is much less indented than the southern side and is less dangerous to approach. On the northern side, about 6 cables eastward of Konstantinovskaya kosa, is the old Mikhaylovskaya (Michael) fort, and between them is a point on which stands  
 15 Nakhimova (Nachimoff) battery.

About 2 cables eastward of Mikhaylovskaya fort is a cove (Severnaya cove), from the head of which Balka Severnaya extends inland, and about 2 cables farther eastward is another cove (Sukhaya creek), at the head of which is Balka Sukhaya; the latter cove affords anchorage in  
 20 depths of from 18 to 24 feet (5m5 to 7m3).

The coastal bank, with depths of less than 30 feet (9m1), extends about  $1\frac{1}{2}$  cables southward of the point on which is Nakhimova battery, about one cable off the point on which is Mikhaylovskaya fort, and about  $1\frac{1}{4}$  cables off the point between the mouths of Balka Severnaya and  
 25 Balka Sukhaya; a red conical buoy surmounted by a cone, point down, marks the edge of this bank off Nakhimova battery, and a red spar buoy surmounted by a cone, point down, marks its edge off each of the two other points.

Artilleriyskaya (Artillery) bukhta is entered on the southern side of the  
 30 harbour, between a point about 3 cables eastward of Mys Aleksandrovskiy and a point about  $2\frac{1}{2}$  cables farther east-north-eastward. The coastal bank, with depths of less than 30 feet (9m1), extends about one cable northward of Mys Aleksandrovskiy and about  $1\frac{1}{4}$  cables northward of the western entrance point of the bay. A white spar buoy surmounted  
 35 by a black cone, point up, is moored on this bank about half a cable north-north-westward of the western entrance point. Artilleriyskaya bukhta, which is but little sheltered from northerly winds, is used by small coasting vessels which can lie at two small piers.

There are several mooring buoys in the western part of Sevastopol's-  
 40 skaya bukhta.

**Yuzhnaya bukhta.—Light.—Buoys.**—Yuzhnaya (South) bukhta is entered between Nikolayevskiy (Nicholas) mys ( $44^{\circ} 37' N.$ ,  $33^{\circ} 32' E.$ ) and Pavlovskiy (Paul) mys, which is prominent, about  $2\frac{1}{2}$  cables east-south-eastward. Its shores are steep-to and large vessels can secure close  
 45 off them. Naval vessels anchor off the eastern side of the bay with stern hawsers laid out to the shore, or moor to buoys in the centre of the bay. Pavlovskiy light is exhibited, at an elevation of 15 feet (4m6), from a white framework structure, 13 feet (4m0) in height, situated on Pavlovskiy mys.

50 On the western side of the bay, a short distance southward of Nikolaevskiy mys, is the prominent Komintern naberezhnaya, from which a broad flight of steps, with a colonnade at the top, leads to the town; this quay is used as a boat landing. Between this quay and the point are three small jetties, from one of which ferries run regularly across the bay and  
 55 to various places on the northern side of Sevastopol'skaya bukhta.

Close within Pavlovskiy mys is the Naval Observatory, a white, two-

**Chart 2233.**

storeyed building with twin towers and a flagstaff, and a short distance farther eastward is the Naval Hospital.

Pavlovskiy mys is fringed by a bank, with depths of less than 30 feet (9m1), which extends about half a cable north-westward from it. The northern edge of the bank is marked by a white spar buoy, surmounted by a black cone, point up, and its western extremity by a black and white spar buoy surmounted by two cones, bases together. 5

Korabel' naya bukhta (Dockyard creek) is entered on the eastern side of Yuzhnaya bukhta, close southward of Pavlovskiy mys. The whole of the eastern side of this bay is occupied by the Administrative buildings of the Naval Port, and the whole of the promontory lying between Korabel' naya bukhta and Yuzhnaya bukhta is occupied by dockyard buildings and wharves. There are dry docks at the head of Korabel' naya bukhta. 10

The Naval Barracks stand on high ground on the eastern side of Yuzhnaya bukhta, about half a mile southward of Pavlovskiy light-structure, and abreast these barracks is a floating dock, moored close off the eastern shore of Yuzhnaya bukhta. 15

There are several wharves and many small jetties on the shores of Yuzhnaya bukhta, and near its head is a coal store with a small jetty close by alongside which vessels of medium draught can lie. 20

**Compass adjustment buoy.**—A buoy, painted in red and white vertical stripes, which is used only by vessels adjusting compasses, is moored about  $1\frac{1}{2}$  cables north-north-eastward of Pavlovskiy light-structure. 25

**Eastern part of Sevastopol'skaya bukhta.—Obstruction.—Anchorages.**—On the northern side of the harbour, about 6 cables eastward of the mouth of Balka Sukhaya, is a small cove at the head of which Balka Panaiotova extends inland. On the western side of this cove are the Artillery barracks with some small piers and at its head there is a large graving dock, *see* Appendix I. 30

Kilenbalochnaya (Careening) bukhta, on the southern side of the harbour, is entered about one mile eastward of Pavlovskiy mys ( $44^{\circ} 37' N., 33^{\circ} 32' E.$ ).

An obstruction, with a depth of 26 feet (7m9) over it, lies about  $1\frac{1}{2}$  cables north-north-eastward of the eastern entrance point of Kilenbalochnaya bukhta and another obstruction, with a depth of 24 feet (7m3) over it, lies about  $6\frac{1}{2}$  cables east-south-eastward of the same point and about three-quarters of a cable offshore. 35

On the northern side of the harbour about 4 cables eastward of the Artillery barracks, is a point on which is the site of an old battery. Between this point and another point about 3 cables farther south-eastward, is a bay in which anchorage, except during westerly winds, may be obtained in depths of from 18 to 30 feet (5m5 to 9m1). 40

From the eastern entrance point of this latter bay the coast trends eastward for about half a mile to the mouth of Balka Sukharnaya and is moderately steep-to. Eastward of Balka Sukharnaya there are some white cliffs. Small craft may obtain secure anchorage, in depths of from 12 to 18 feet (3m7 to 5m5) off the mouth of Balka Sukharnaya. 45

**Head of Sevastopol'skaya bukhta.—Lights.**—A petroleum basin, protected by two moles, is situated on the northern part of the head of Sevastopol'skaya bukhta. A light is exhibited, at an elevation of 20 feet (6m1), from the head of each of these moles. 50

Leading light-beacons have been established on the eastern side of the Petroleum basin. The front light is exhibited, at an elevation of 16 feet (4m9), from a white pyramidal beacon, with a black vertical stripe, 55



**Chart 2233.**

16 feet (4m9) in height, situated close within the eastern side of the basin; the rear light is exhibited, at an elevation of 26 feet (7m9), from a similar beacon, 26 feet (7m9) in height, situated about 2½ cables east-south-eastward of the front beacon. These light-beacons in line, bearing about 103°, lead into the basin.

There is a wharf on the northern side of the Petroleum basin, close south-eastward of the root of the northern mole.

A mud bank, with depths of less than one fathom (1m8), extends about 3 cables off the mouth of Reka Chernaya, which flows into the head of the harbour close southward of the Petroleum basin. A shallow channel, marked by buoys, leads through this bank to the mouth of the river.

**Sevastopol'.—Signal stations.—Storm signals.**—The city of Sevastopol' (44° 37' N., 33° 31' E.), with a population in 1967, of about 200,000, is situated on the western side of Yuzhnaya bukhta. The great Vladimirskiy cathedral, a white building with a cupola surmounted by a gilded cross, towers above the other buildings in the town. The climate is healthy and the only local disease is a harmless fever, locally known as "moskitva," which has spread along the whole southern coast of the Crimea and affects people on their first visit.

Besides the Naval hospital there are an infirmary and several clinics and sanatoria in the town.

The principal signal station is situated on Nikolayevskiy mys, and there is another at the disused Konstantinovskaya fort.

Storm signals, *see* page 18, are displayed from a mast on the office of the Black Sea Fleet Hydrographic Department, situated near the cathedral, and from a mast at the disused Konstantinovskaya fort.

**Navigational information.**—The office of the Black Sea Fleet Hydrographic Department will supply all information with regard to pilotage in the Black sea and Sea of Azov.

**Port facilities.—Radio station.**—A stock of coal is maintained.

Fuel oil can be supplied.

Provisions of various kinds can be obtained. Fresh water is laid on to the quays and jetties.

There are three dry docks, the largest being situated at the mouth of Balka Panaiotova, and the others at the head of Korabel' naya bukhta. For dimensions of the largest, *see* Appendix I.

In Yuzhnaya bukhta there is a small floating dock and a slipway capable of taking vessels up to 2,000 tons.

There is regular sea communication with all U.S.S.R. ports in the Black sea and Sea of Azov.

**De-ratting.**—De-ratting certificates can be issued.

**Life-saving.**—Lifeboats are stationed at Pavlovskiy mys and on the western side of Artilleriyskaya bukhta; the latter station is open only during the summer.

**Winds and weather.**—Owing to the configuration of the land, most gales at Sevastopol' are southerly. Meteorological information can be obtained from the office of the local Naval observatory, which is always open.

**Ice.**—In the most severe winters ice appears for a very short period but does not obstruct navigation. In 1911, thin sheets of ice formed close inshore and, being torn away by the waves, drifted for a short time in the harbour. In 1923 and 1926, part of the harbour was covered for a few hours with a thin, glassy crust.

**Climatic table.**—*See* page 78.

*Chart 2233.*

**SOUTHERN COAST OF THE CRIMEA.—Aspect.**—The general character of the southern coast of the Crimea from Mys Khersones ( $44^{\circ} 35' N.$ ,  $33^{\circ} 23' E.$ ) to Kerchenskiy proliv (Kerch'Yenikale strait), about 135 miles east-north-eastward, is mountainous, and between Mys Khersones and Feodosiya (Theodosia), about 90 miles east-north-eastward, it is backed by the Taurus range.

Between Mys Khersones and Mys Ayya (Aia), about 15 miles south-eastward, precipitous cliffs, inaccessible in most places, rise from the sea. From Mys Ayya (page 281) to Mys Meganom, about 65 miles east-north-eastward, the seaward slopes of the range rise from the sea and are sheltered from northerly winds by mountains which attain an elevation of over 3,500 feet (1,066m). On this stretch of coast there are numerous villages and the land is covered with luxuriant and varied vegetation.

The most prominent landmarks on this stretch of coast are the following promontories:—Mys Feolent and Mys Ayya, *see* views [12], [13] and [18]; Mys Sarych (Sarich), about 4 miles south-eastward of Mys Ayya; Mys Aytodor (Aitodor), about 17 miles eastward of Mys Sarych; Mys Ayu-Dag, about 12 miles north-eastward of Mys Aytodor; and Mys Meganom. The following mountains are also distinctive landmarks:—Somnalykh, 1,900 feet (579m) high, about three-quarters of a mile northward of Mys Ayya; Ay-Petri, 3,970 feet (1,210m) high, about  $3\frac{1}{2}$  miles west-north-westward of Mys Aytodor, which mountain is very distinctive on account of its light colour and which, when seen from eastward or westward, presents an appearance of several vertical cliffs, but from southward, appears as a precipitous wall overhanging the village of Alupka; Chatyr Dag (Chatuir Dagh), described on page 287, situated about  $11\frac{1}{2}$  miles northward of Mys Ayu-Dag; and Eski-Dag or Chalka and Kara-Dag or Chernaya, both described on page 291, situated about 7 miles northward and 11 miles north-eastward, respectively, of Mys Meganom.

**Prohibited area.**—*See* page 268.

**Measured distance.—Beacons.**—There is a measured distance, 4.84 miles in length, off the coast between Mys Khersones and Mys Feolent ( $44^{\circ} 30' N.$ ,  $33^{\circ} 29' E.$ ). This distance is marked by three pairs of beacons, each consisting of a framework shield, painted white with a red central vertical stripe; the front beacons are each surmounted by a red triangle, point, up and the rear beacons by a red triangle, point down. The course for running the measured distance is  $137^{\circ}$  or  $317^{\circ}$ . The distance between the north-western and central pairs of beacons is 1.99 miles, and that between the central and south-eastern pairs is 2.85 miles.

**Current.**—The general current of the main Black sea circulation sets westward along the coast and is especially strong off the headlands and off the stretch of coast between Mys Chauda, about 34 miles east-north-eastward of Mys Meganom, and Mys Kyz-Aul (Kiz-Aul), about 23 miles farther eastward. Its normal rate is from a half to three-quarters of a knot, but, under certain conditions, is as much as 2 knots. In the offing, the current is weak and imperceptible. *See* also page 296.

**Winds.**—Off the southern coast of the Crimea between Mys Ayya and Feodosiya, north-easterly winds prevail in winter, and when strong, usually blow harder near the coast than in the offing. Winds from south and south-west are infrequent in winter and of short duration. Between Mys Ayya and Yalta a precipitous coastal ridge screens the sea near the shore and there is much calm weather.

*Chart 2233.*

**MYS KHERSONES TO MYS AYTODOR.**—**Mys Khersones to Mys Georgiya.**—**Coast.**—**Dangers.**—**Light.**—From Mys Khersones ( $44^{\circ} 35' N., 33^{\circ} 23' E.$ ) the coast trends south-eastward and rises gradually  
 5 for about 7 miles to Mys Feolent. On this stretch of coast the upper stratum is whitish in colour and the lower strata are reddish. About one-third of the distance along this stretch there is a small flat-topped point, south-eastward of which are several valleys. Nearer Mys Feolent, cliffs rise in regular steps from the sea.

10 Mys Feolent is 526 feet (160m3) high and precipitous; its upper part is yellowish and its lower part dark in colour. Seen from north-westward and from eastward, the summit of the cape appears saddle-shaped. From the former direction, a large and distinctive pear-shaped rock can be seen close off the cape, and from the latter direction the cape can be identified  
 15 by another sharply-pointed rock near its foot. From southward, the saddle on the summit is not apparent but from this direction the cape may be identified by its yellowish summit and dark foot. *See views [12], [15], and [16].*

Mys Feolent is fringed by a reef on which the sea sometimes breaks  
 20 and which, on the south-western side of the cape, extends about  $1\frac{1}{2}$  cables offshore. An 18-foot (5m5) rocky patch lies about a quarter of a mile east-north-eastward of the cape.

A sanatorium, formerly St. George's monastery, which has a prominent bell-tower, stands at the upper end of a deep cleft near the head of a  
 25 bight which is entered between Mys Feolent and a reddish-coloured point about one mile eastward. Landing may be affected at the head of the bight where the shore is low. Georgiyevskaya skala, a lofty rock on which there is a white marble crucifix, stands about half a cable offshore abreast the sanatorium. *See views [16] and [17].*

30 From the reddish-coloured point to Mys Georgiya, the western entrance point of Balaklavskaya (Balaklava) bukhta, about  $3\frac{1}{4}$  miles eastward, the coast is steep-to and consists of lofty, sheer and inaccessible cliffs which are of even elevation over the whole distance.

Kaz-bashi light is exhibited from a red framework tower with a white  
 35 daymark, with a black central stripe, situated on Balaklava bluff, about 3 miles east-south-eastward of Mys Feolent.

**Balaklavskaya bukhta.**—**Aspect.**—**Lights.**—Balaklavskaya bukhta is entered between Mys Georgiya ( $44^{\circ} 29' N., 33^{\circ} 36' E.$ ) and Mys Balaklavskiy, about  $1\frac{1}{2}$  cables east-north-eastward. Its entrance is  
 40 narrow and winding and, in consequence, difficult to navigate, and many mariners prefer Laspinskaya (Laspi) bukhta (page 282) as a place of refuge. The entrance is difficult to identify especially from westward, as the harbour is backed by lofty cliffs. A short distance westward of the entrance the cliffs become lower and then rise again to a large, pointed  
 45 summit about half the elevation of the level cliff eastward which slopes down to Mys Georgiya, which cape is small and has several large, above-water rocks close off it. From southward or south-eastward the entrance is not so hard to make out as the high ground eastward slopes down to the harbour and forms a deep valley between it and the lofty cliffs inland  
 50 which can be seen over the lower land near the entrance. The shores of the harbour rise close inland to steep, reddish-coloured, rocky hills; they are lined with quays.

A light is exhibited, at an elevation of 84 feet (25m6), from a black framework structure with a white stripe, 22 feet (6m7) in height, situated  
 55 on the western extremity of Mys Balaklavskiy. This light forms the front light of a pair of leading lights which, when in line bearing  $359\frac{1}{2}^{\circ}$  lead

*Chart 2233.*

to the entrance to the harbour; the rear light is exhibited, at an elevation of 280 feet (85m3), from a white shield with a black vertical stripe.

A mud flat, with depths of less than 6 feet (1m8), extends about 1½ cables from the head of the harbour and an above-water rock, surrounded by sunken rocks, lies about half a cable off the western shore, about 2 cables from the head of the harbour. 5

The water in the harbour is remarkably clear and is subject to peculiar changes in temperature, often by as much as 10° C., during a single day; this is apparently due to a current entering from seaward. 10

**Anchorage.—Prohibited anchorage.**—As a general rule good holding ground is not found in the approach to Balaklavskaya bukhta in depths of less than 25 fathoms (45m7), in which, and greater depths, the bottom is stiff mud and sand. Vessels sometimes anchor in the shallower depths near an 11-foot (3m4) rocky patch (Balaklava rock), *see* below. 15

Anchorage, sheltered from all winds, may be obtained in depths of 42 feet (12m8) in the middle of the harbour westward of the town of Balaklava. The nature of the bottom is sand and shells in the narrow part of the harbour, and mud and sand at the anchorage westward of the town. 20

Vessels entering the harbour should keep in mid-channel and proceed at a moderate speed as the turns are sharp.

It is stated locally that south-easterly and southerly winds blow home with force but raise no great sea off the entrance. Violent squalls blow down the gullies on the eastern side of the entrance, especially after rain, when the land breeze commences earlier than usual and is later in giving place to the sea breeze; these squalls should be guarded against when entering the harbour. 25

**Prohibited area.**—*See* page 268.

**Town.—Port facilities.**—The town of Balaklava (44° 30' N., 33° 36' E.) stands on the eastern shore of the harbour; in 1930, the population was about 2,600. There is a hospital in the town.

Limited supplies of provisions may be obtained. Fresh water is available.

**Mys Balaklavskiy to Mys Sarych.—Dangers.—Anchorage.—** 35  
**Navigational aids.**—From Mys Balaklavskiy the coast trends south-eastward for about 5 miles to Mys Ayya (Aia) and resembles a great wall of greyish-coloured rock, about 1,500 feet (457m2) high. This wall terminates abruptly at Mys Ayya which from a distance, appears as a dark-coloured bluff, and is remarkable for its steepness and for its elevation of 1,290 feet (585m2). *See* view [18] and Appendix III. 40

This stretch of coast is fringed by above-water and sunken rocks lying close offshore. An 11-foot (3m4) rocky patch (Balaklava rock) lies at the outer end of an area of foul ground which extends about 3 cables south-south-westward from the coast about 13 cables south-eastward of Mys Balaklavskiy; abreast this rocky patch there is a sandy beach, within which the hilly spurs terminate in a bluff. This rocky patch is steep-to on its seaward side. 45

An above-water rock, the vicinity of which has not been examined, lies in a position with Mys Sarych (Sarich) in line with Mys Ayya, about half a mile west-north-westward of the latter point and about a quarter of a mile offshore. 50

Vessels should give a wide berth to the coast between Mys Balaklavskiy and Mys Ayya.

Between Mys Ayya and Mys Sarych, about 4 miles south-eastward, there is a small bight, at the head of which and entered between the 55

*Chart 2233.*

low eastern side of Mys Ayya and Mys Laspi, a small point about 2½ miles eastward of Mys Ayya, is Laspinskaya (Laspi) bukhta. The shores of this bay are steep-to and are backed by high, tree-covered cliffs and at its head is a low, gravel beach on which there are some buildings. The villas of Bati-Liman, a summer bathing resort, stand at the foot of the cliffs north-eastward of Mys Ayya.

At the southern end of the low beach is a group of rocks within which small craft with local knowledge can secure; landing can be effected here.

- 10 Laspinskaya bukhta affords good shelter from winds between west-north-west, through north, to south-east, and is often used by vessels sheltering from the easterly winds which prevail in winter. South-south-westerly winds render the anchorage dangerous. Anchorage may be obtained westward of Mys Laspi, in depths of 20 fathoms (36m6). During offshore winds, which blow in heavy squalls off the mountains, vessels should anchor nearer the head of the bay as the bottom there does not slope so steeply and the holding ground is, therefore, better. In depths of 20 fathoms (36m6) the bottom is mud, in from 60 feet to 12 fathoms (18m3 to 36m6), mud and sand, and in lesser depths, clean sand.

- 20 Vessels entering Laspinskaya bukhta should sound continuously as the changes in depths are rapid.

Mys Sarych (Sarich) (44° 23' N., 33° 44' E.), the southernmost point of the Crimea, rises to Skala Laspi, a large and prominent crag, 2,420 feet (737m6), about one mile northward. From westward or eastward, the point presents a very irregular outline with three rugged hummocks. See view [19]. There are several above-water rocks southward of the point, of which Kamen Sarych (Sarich) lies about 2 cables offshore and rises from depths of 30 fathoms (54m9).

- A light is exhibited, at an elevation of 125 feet (38m1), from a white, circular, metal tower, 35 feet (10m7) in height, situated on Mys Sarych. A fog signal is sounded from the lighthouse.

**Prohibited area.**—See page 268.

**Mys Sarych to Mys Aytodor.—Aspect.—Dangers.—Anchorage.**

—From Mys Sarych the coast trends eastward for about 10½ miles to

- 35 Mys Kikineyz (Kikeneiz). Between them are the following points, all of which are moderately low and can only be distinguished from close inshore:—Nikolaya (St. Nicholas), Katyrlı, Ayufka-Burnu (Liufka-Burnu), Gagra-Burnu (Hagra Burnu) and Troitsy (Troitsi), situated respectively, 2, 3, 4, 4½ and 9 miles eastward of Mys Sarych.

- 40 Yayla (Yala) range, with, in places, bare and precipitous peaks from which spurs, covered with cultivation, slope down to the coast, lies from about three-quarters of a mile to 3 miles within this stretch of coast. Within the bight between Mys Gagra-Burnu and Mys Kikineyz, this range is somewhat lower and lies farther inland.

- 45 The most prominent landmark near this stretch of coast is Foros church, which stands on a high, isolated rock situated about one mile northward of Mys Nikolaya. Close north-eastward of the church is Bardarskiye vorota, a pass over a small saddle in Yayla range near some steep cliffs. The village of Mshatka lies near the coast between Mys

- 50 Katyrlı and Mys Ayufka-Burnu.

Mys Kikineyz (44° 24' N., 33° 59' E.) appears wedge-shaped from westward and has a pointed hillock on its summit. It is fringed by a number of detached rocks, some of which are awash and extend about one cable eastward from it. Within the cape are several prominent and

- 55 irregularly-shaped peaks.

From Mys Kikineyz the coast trends east-north-eastward for about

*Chart 2233.*

6½ miles to Mys Aytodor (Aitodor). Close eastward of Mys Kikineyz is a small bight which has a sandy beach through which flows a stream. On the eastern side of this bight is a very prominent group of cliffs, eastward of which, lying close offshore about one mile from Mys Kikineyz, is Kamen Dziva, a detached, above-water rock which is whitish in colour. Eastward of the prominent cliffs the villas of Novyy Simeiz (Simeis) extend along the coast, with a two-storeyed building prominent among them. Farther eastward is the village of Staryy Simeiz, with another prominent building with a portico and a pier for boats. From the vicinity of these villages to Mys Aytodor is the most thickly populated part of the coast of the Crimea.

Mys Il'men-Burnu (Ilmen), on which there is a group of white buildings, is a small point about 2¼ miles east-north-eastward of Mys Kikineyz. Depths of 36 feet (11m0) and less extend as much as 3 cables southward of Mys Il'men-Burnu.

The village of Alupka stands on a very steep slope about one mile north-eastward of Mys Il'men-Burnu and about 1½ miles southward of the light-coloured Gora Ay-Petri (page 279). North-eastward of this mountain, Yayla range trends north-eastward and recedes inland.

The main feature of Alupka is a palace, built in the Moorish style, standing in a large park. Westward of the park is the former church which has columns similar to a classical temple.

Abreast a pavilion in the village is a group of large rocks, between the fourth and fifth of which, counting from westward, there is a small basin in which is a pier, with a depth of 13 feet (4m0) at its head. Reefs extend from each side of the rocks fronting the entrance, and caution is necessary to avoid them when entering the basin. During south-westerly winds, the best landing place is within the easternmost rock of the group.

Anchorage may be obtained, in a depth of 20 fathoms (36m6), mud, abreast the pavilion, with Mys Aytodor bearing 074°. Closer inshore there are depths of from 60 feet to 14 fathoms (18m3 to 25m6), mud and sand or mud and shells.

From abreast the village of Alupka to Mys Aytodor, about 3 miles east-north-eastward, the coast consists of yellowish-coloured cliffs. The village of Gaspra, which in there is a large and prominent white house with twin towers, is situated about 2 miles east-north-eastward of Alupka.

**Prohibited anchoring and fishing areas.—Prohibited area.**—Anchoring and fishing are prohibited in an area bounded by the following points:—From a position about 5 cables westward of Mys Sarych in a southerly direction for about 9 miles; thence east-north-eastward for just under 6 miles, and thence north-north-eastward to the shore.

Fishing is prohibited in an area commencing from the south-western corner of the above area; thence westward for about 11 miles; thence southward for about 5 miles; thence east-south-eastward for about 11 miles and thence northward to the point of origin. Attention is drawn to "*LAWS AND REGULATIONS APPERTAINING TO NAVIGATION*" on page 1.

**Dumping ground.**—A rectangular area used for dumping explosives, about 5 miles long from east to west and 3 miles wide, lies with its north-eastern corner about 3 miles south-south-eastward of Mys Kikineyz. In 1962, it was reported that a can buoy, painted in black and white bands, surmounted by a triangular topmark, was moored about 3½ miles west-south-westward of the north-western corner of the dumping ground. In 1963, it was reported that a buoy was moored about midway along

*Chart 2233.*

the southern side of the same area. Two mooring buoys were situated about 8 miles east-south-eastward of the north-eastern corner of the same area.

- 5 **Mys Aytodor.**—**Navigational aids.**—Mys Aytodor ( $44^{\circ} 26' N.$ ,  $34^{\circ} 08' E.$ ) is the termination of the south-eastern spur of Gora Megabi, which attains an elevation of 2,653 feet (808m6) about  $2\frac{1}{4}$  miles north-north-westward.

- A light is exhibited, at an elevation of 315 feet (96m0), from a white, 10 octagonal metal tower, situated on Mys Aytodor. A radiobeacon transmits from the lighthouse.

- Viewed from eastward or westward, Gora Megabi appears as a spur sloping gradually down from Yayla range towards Mys Aytodor, near which point there is a dip from which the extremity rises and then slopes 15 steeply to the sea. From southward, this mountain appears as a cone with a broad base. Mys Aytodor has two projections, on the western of which stands the lighthouse. On the eastern projection, standing on a high, precipitous rock, there is a castellated building which, from a distance may be mistaken for the lighthouse. On the western side of 20 the cape there are some grey buildings, close off which is a detached rock. *See* views [21], [22] and Appendix III.

There is a boat landing in a small cove about 4 cables north-eastward of the lighthouse.

**MYS AYTODOR TO MYS MEGANOM.**—*Yaltinskaya bukhta.*—

- 25 **Dangers.**—**Anchorage.**—Yaltinskaya (Yalta) bukhta is entered between Mys Aytodor and Mys Nikitin, about  $7\frac{1}{4}$  miles north-eastward; at the head of the bay are the roadstead, port and town of Yalta. The eastern slopes of Gora Megabi slope down to the western shore of the bay and terminate in a sandy beach a short distance southward of the old town; 30 they are covered with vineyards, orchards and gardens. The white buildings of the old town, on the north-eastern side of the harbour, are visible from a considerable distance seaward.

- A coastal reef extends a short distance from the western side of the bay, and about  $2\frac{1}{2}$  miles north-north-eastward of Mys Aytodor, there 35 are a number of large, above-water rocks on one of which is a mast; there are also several sunken rocks which extend about one cable offshore. A pavilion, situated on the hillside about three-quarters of a mile north-north-eastward of Mys Aytodor, is a prominent landmark. This side of Yaltinskaya bukhta may be safely approached to a distance of half a 40 mile offshore.

- A wide ravine descends from between Gora Megabi and Yayla range northward of it, and another ravine lies between the range and a spur which slopes down from it to Mys Nikitin. These two ravines unite near the head of the bay and form a small plain on which stands 45 the central part of the town of Yalta. A secondary spur slopes down from that terminating in Mys Nikitin to Mys Ioanna at the head of the bay.

- Between Mys Ioanna and Mys Nikitin there is a low, narrow beach, within which steep cliffs rise to the slopes of the above-mentioned spurs; 50 these slopes are covered with houses and gardens.

Mys Nikitin is fringed by above-water rocks which extend about three-quarters of a cable offshore.

- Anchorage can be obtained, in depths of from 48 to 54 feet (14m6 to 16m5), abreast the village of Orianda ( $44^{\circ} 27' N.$ ,  $34^{\circ} 08' E.$ ) which is 55 situated about 2 miles northward of Mys Aytodor and about 2 cables

*Chart 2233.*

off the outermost detached rock. Landing can be effected northward of the submerged rocks about half a mile farther northward.

**Prohibited anchorage.**—Anchoring and fishing are prohibited in an area, indicated on the chart, which extends  $1\frac{1}{2}$  miles offshore about one mile westward of Mys Nikitin. 5

**Range of water level.**—With north-easterly winds in the Black sea the water level in Yaltinskaya bukhta falls rapidly, and with southerly or south-westerly winds there is always a perceptible rise in the water level. These changes of water level fluctuate within the limits of 2 feet (0m6). 10

**Yaltinskiy reydy.**—**Anchorage.**—**Current.**—Yaltinskiy (Yalta) reydy is open from between east-north-east and south: although winds from seaward are seldom strong a considerable sea often sets in. See also under Winds on page 286.

The best anchorage is in depths of from 60 feet to 13 fathoms (13m3 to 23m8), mud, or mud and sand, southward of a conspicuous church which is situated in the north-eastern part of the town and has a square white tower and dome. Farther inshore the nature of the bottom is sand. 15

An appreciable current has been experienced at this anchorage.

Southerly winds, even when light, send in some swell, athwart which vessels may be set by the current, and roll uncomfortably. A spring, laid out north-north-westward, will check this. 20

**Yaltinskiy port.**—**Light.**—**Buoys.**—Yaltinskiy (Yalta) port, which never freezes, is of great commercial importance to the southern coast of the Crimea, which is cut off from the remainder of the peninsula by mountain ranges. It is also important as a place of refuge during north-easterly gales. 25

The harbour is protected by a mole which extends about 3 cables south-westward from Mys Ioanna ( $44^{\circ} 29' N.$ ,  $34^{\circ} 10' E.$ ). Its inner part, as far as a slight elbow about midway along it, is known as Staryy mol, and the outer part, at the head of which is a short spur extending north-westward, as Novyy mol. 30

A light is exhibited from a white octagonal tower situated on the head of Novyy mol. A light is exhibited at an elevation of 32 feet (9m8) from a mast, 25 feet (7m6) in height, situated on the spur close westward of the mole head. 35

Severnaya naberezhnaya, about one cable in length, lies between the root of Staryy mol and the mouth of Reka Derekiy north-westward. On the western side of the mouth of this river and between it and a building slip, is Kabotazhnaya or Coasting Trade naberezhnaya, which is also about one cable in length. 40

The harbour limits extend southward to the mouth of Reka Uchan Su, about  $2\frac{1}{2}$  cables south-westward of the head of Novyy mol.

The coastal bank, with depths of less than 18 feet (5m5), extends in places as much as  $1\frac{1}{2}$  cables off the western side of the entrance to the harbour; its eastern edge is marked by two red spherical buoys. 45

**Caution.**—Owing to deposit brought down by Reka Derekiy, the depths off Kabotazhnaya naberezhnaya are continually shoaling.

**Harbour regulations.**—The following are extracted from the "Obligatory regulations for Yaltinskiy Commercial Port"; Masters of vessels are recommended to obtain a complete copy on arrival. 50

- (1) All vessels, except war vessels, arriving in the port will receive berths by direction of the Harbour Authorities, and may not shift berth without permission.
- (2) Vessels are forbidden to anchor in the channels of the harbour and roadstead. 55



**Chart 2233.**

*Note* :—The channel of the harbour is that area between the line of the mole and the red spherical buoys; and the channel of the roadstead is that area within 700 feet (213m4) of the head of the mole.

- 5 (5) Vessels with explosives on board, when at anchor in the roadstead, must display a red flag by day and exhibit a red light at night.

(6) Vessels entering the port must give way to vessels leaving it.

- Yalta.—Port facilities.—Storm signals.—Radio station.**—The old town of Yalta, is situated on the eastern side of the mouth of Reka Derekiy, and the new town, in which is the commercial quarter, on the western side of the harbour. In 1930, the population was about 28,000, but this number is largely increased in summer by visitors.

- 15 It is one of the most popular pleasure resorts in U.S.S.R. Special permission must be obtained for foreign vessels to visit the port.

The quays can handle large numbers of passengers. The exports consist of wine, fruit and leaf tobacco, and the imports are building material, coal, provisions, fodder and manufactured articles. There is a hospital in the town.

- 20 Provisions of all kinds are available. Fresh water is laid on to Staryy mol (44° 30' N., 34° 10' E.).

Storm signals, *see* page 18, are shown from a mast situated on the elbow of the mole.

- 25 There is regular sea communication throughout the year with U.S.S.R. ports in the Black sea and Sea of Azov.

There is a radio station at Yalta, *see* page 26.

**Life-saving.**—A life-saving station with two motor life-boats is situated near Mys Ioanna. *See* page 25.

- Winds and sea.**—Strong winds from north-west blow in violent squalls from the mountains, rendering it difficult for vessels to berth alongside or leave the mole. These winds occur, however, on only about 30 days in the year.

- 30 The heaviest sea comes from east-south-east. The most frequent sea, especially during the winter, is from between east and east-north-east, but in some years a swell from the south-east quarter has been observed to prevail for the greater part of the year. In Yaltinskaya bukhta it may be said that the sea is generally smooth for about 100 days in the year.

- Mys Nikitin to Mys Ayu-Dag.—Anchorage.—Life-saving.**—Between Mys Nikitin and Mys Ayu-Dag, about 5 miles east-north-eastward, is situated Gurzuf rey, in the north-western corner of which the village of Gurzuf lies stretched along a rocky slope. In front of the village is a low, shingle beach and on its eastern side is a small rocky point, within which a high cliff rises to an old Genoese fort on its summit.

- 40 Kamni Adalar, two large detached rocks, 170 feet (51m8) high, between which there is a sunken rock with a depth of less than 6 feet (1m8) over it, lie about a quarter of a mile southward of a small, bluff point, situated about 2½ miles westward of Mys Ayu-Dag.

- Anchorage may be obtained south-south-eastward of Gurzuf. The best berth is in a depth of 15 fathoms (27m4), with the mouth of a river, which flows through the village, bearing 333°, distant from 5 to 6 cables. Within this berth the depths shoal gradually, and in depths of 13 fathoms (23m8) the nature of the bottom is clean sand. This anchorage is sheltered from between south-west, through north, to east-north-east. There is generally a land breeze during the night, and during the autumn and winter this land breeze often blows by day with heavy squalls. Abreast the village, there is a pier with a depth of 12 feet (3m7) at its head. This

*Chart 2233.*

pier should be approached westward of the small rocky point mentioned above.

There is daily sea communication during the summer with Yalta ( $44^{\circ} 30' N.$ ,  $34^{\circ} 10' E.$ ) and Alushta.

Anchorage, sheltered from winds from south-west, through north, to north-east, may also be obtained in the bight (Kiziltash bay) between Kamni Adalar and Mys Ayu-Dag. The best berth is in a depth of 16 fathoms (29m3), and this depth is found close inshore on the eastern side of the bight. The land breeze here has the same peculiarity as in the anchorage off Gurzuf.

There is a life-saving station with a lifeboat at Gurzuf, *see* page 25.

Mys Ayu-Dag projects south-eastward from the general line of the coast and is a prominent landmark. It rises to a detached mountain, 1,850 feet (563m9) high about three-quarters of a mile north-westward of the cape; the greatest elevation is at the north-western end of this mountain and there is a knob near the extremity of the cape. From a distance, the cape somewhat resembles a bear lying down, *see* views [21], [23] and Appendix III.

**Current.**—The general west-going current, chiefly due to easterly winds, is felt at its greatest strength near Mys Ayu-Dag. *See* also pages 279, 296.

**Mys Ayu-Dag to Alushta.—Aspect.**—From Mys Ayu-Dag ( $44^{\circ} 33' N.$ ,  $34^{\circ} 21' E.$ ) the coast trends north-north-eastward for about 8 miles to a pier abreast the town of Alushta.

Bolgator utes, a sheer precipice, 1,370 feet (417m6) high, rises about 4 miles northward of Mys Ayu-Dag and forms an excellent landmark; the village of Buyuk-Lampad (Buyuk-Lambat) lies at the foot of the cliff.

Gora Chatyr Dag (Chatuir Dag), situated about  $11\frac{1}{2}$  miles north-north-eastward of Mys Ayu-Dag, is the highest mountain in the Crimea. Its summit is conical and has two peaks, of which the south-western is 4,998 feet (1,523m4) high, and the north-eastern, 4,610 feet (1,405m1) high. *See* views [23], [24].

Gora Demerdzhi (Demirdzhi) lies about 6 miles east-north-eastward of Gora Chatyr Dag; it is 3,990 feet (1,216m2) high and can be identified by its precipitous cliffs. There is a prominent tall, grey church in the village of Demerdzhi, about  $1\frac{1}{2}$  miles south-westward of the summit of this mountain.

Indek-Dag, a bare, rounded cliff about 4 miles north-eastward of Gora Chatyr Dag, is very prominent from the roadstead off Alushta.

Gora Sinap-Dag (Sinap-Dagh), an outstanding mountain about 6 miles south-south-eastward of Gora Chatyr Dag, is very prominent from an offing eastward of Alushta.

**Coast.—Anchorages.—Dangers.**—From Mys Ayu-Dag the coast trends northward for about  $1\frac{1}{2}$  miles to the village of Partenit, which lies at the foot of a bluff rising precipitously from the sea. Between this bluff and Mys Ayu-Dag is a low beach within which are numerous gardens and orchards.

Anchorage may be obtained off the village of Partenit, the best berth being in a depth of 45 feet (13m7), black sand, with the summit of the bluff bearing about  $315^{\circ}$ , distant about 3 cables, Mys Ayu-Dag bearing  $194^{\circ}$  and Bolgator utes bearing about  $360^{\circ}$ .

Between the village of Partenit and Mys Plaka, about  $1\frac{1}{2}$  miles north-eastward, the coast forms a bight the western shore of which is fronted by a bank, over which there are depths of 19 feet (5m8) about 2 cables

**Chart 2233.**

offshore. The village of Kuchuk Lampad (Kuchuk Lambat) is situated on the north-western shore of this bight, close westward of Mys Plaka.

Mys Plaka ( $44^{\circ} 35' N.$ ,  $34^{\circ} 22' E.$ ) is about 200 feet (61m0) high. It may be readily identified by a white, square tower situated on a hill a short distance northward of the cape, and by a yellow house with a pointed, red roof. Several detached rocks, some of which are sunken, extend about 2 cables eastward from the cape; these rocks are steep-to seaward.

10 Anchorage, sheltered from winds between south-south-west, through north, to east-north-east, may be obtained in depths of 33 feet (10m1), black sand, abreast the village of Kuchuk Lampad. Small craft with local knowledge moor stern to shore under the cape where there is better shelter. This anchorage is generally used during south-westerly winds, but these winds often blow with violence through the gap northward of the mountain close within Mys Agu-Dag.

Mys Buyuk-Lampad (Kamish), about 3 miles north-north-eastward of Mys Plaka, rises to Kholm Kastel', 1,500 feet (457m2) high, about three-quarters of a mile westward. Though low in comparison with other mountains in the vicinity, Kholm Kastel' stands out prominently from south-eastward, from which direction it resembles a blunted cone. There are numerous houses on its seaward slopes.

From the foot of Kholm Kastel', a flat-topped hill extends towards the town of Alushta but slopes down to a low stretch of coast south-south-westward of that town.

**Reyd Alushta.—Light.—Fog signal.—Anchorage.**—Reyd Alushta is an open roadstead off the town of Alushta. The town is situated on the foothills of Gora Chatyr Dag between two wide valleys through which flow mountain streams, the south-westernmost stream being Rechka Ulu-Uzen'. A pier with a depth of 14 feet (4m3) at its head, is situated about half a cable northward of the mouth of Rechka Ulu-Uzen'. In 1943, this pier was reported to be in ruins. See view [24].

Alushtinskiy light is exhibited, at an elevation of 60 feet (18m3), from a metal hut, painted red with white bands, on supports, 20 feet (6m1) in height, situated about one cable northward of the mouth of Rechka Ulu-Uzen'. A fog signal is occasionally sounded from a position in the town.

The best anchorage in Reyd Alushta is in depths of 15 fathoms (27m4), mud and shells, with Alushtinskiy light bearing  $315^{\circ}$ ; closer inshore on the same bearing, the depths shoal rapidly to 60 feet (18m3) sand.

The anchorage is open from north-east, through south, to south-west. The wind blows off the mountains in heavy squalls. In settled weather there is a steady land breeze at night.

**Town.—Port facilities.**—In 1930, the population of Alushta was about 4,800. There is a hospital in the town. Provisions and fresh water are available.

There is regular sea communication between Alushta and other Black sea ports, but in winter, bad weather frequently prevents vessels from calling.

50 **Alushta to Mys Choban-Kale.—Aspect.**—From the pier at Alushta the coast trends east-north-eastward for about 16 miles to Mys Choban-Kale.

Within this stretch of coast the mountain range, which is separated from Gora Demerdzhi (page 287) by a deep notch, runs parallel with the coast in an unbroken wall to a position about 11 miles from that mountain. The range decreases in elevation eastward and the forests disappear.

*Chart 2233.*

The peak of Khrykul', a sharply-pointed cone, 2,810 feet (856m5) high, lying about 6 miles north-westward of Mys Choban-Kale ( $44^{\circ} 49' N.$ ,  $34^{\circ} 45' E.$ ), is particularly prominent. Near the eastern end of this range the mountains assume fantastic shapes. Their seaward slopes terminate at the coast in cliffs between which are several ravines, with streams, mostly dry in summer, running through them. 5

**Coast.—Dangers.—Anchorages.**—From Alushtinskiy light-structure the coast trends north-eastward for about  $6\frac{1}{2}$  miles to Mys Sotera, a dark-coloured point terminating in a group of rocks. A sunken rock, over which there is a depth of 5 feet (1m5), surrounded by depths of from 36 to 42 feet (11m0 to 12m8), lies about  $1\frac{1}{4}$  cables offshore and about one mile west-south-westward of Mys Sotera. 10

North-eastward of Mys Sotera there is a small bight, with a low beach, into which flows a stream. Near the mouth of this stream is the village of Kuru-Uzen', and near the north-eastern side of the bight is the village of Malorecenskoye (Kuchuk-Uzen'), standing in an amphitheatre. In this bight there are depths of not less than 18 feet (5m5) about 2 cables offshore. In depths of from 60 feet to 20 fathoms (18m3 to 36m6) the nature of the bottom is clean mud, and in lesser depths, mud and shells, or sand and mud. 15 20

The village of Tuak is situated on a plateau halfway up a hill near the mouth of Rechka Alachuk, about  $1\frac{1}{4}$  miles north-eastward of Mys Sotera.

About  $4\frac{1}{4}$  miles east-north-eastward of the mouth of Rechka Alachuk there is a sandy beach at the mouth of Uskyutskoye ushel'ye, in which there are some large trees. On this beach there is a small pier which has a crane on its head. 25

Mys Choban-Kale ( $44^{\circ} 49' N.$ ,  $34^{\circ} 45' E.$ ), about  $9\frac{1}{2}$  miles east-north-eastward of Mys Sotera, can be identified by the prominent ruins of a tower standing on it. A short distance westward of this point there is a ravine and a coastguard station. 30

Between Mys Choban-Kale and Mys Ay-Foka (A. Foka), about 4 miles eastward, the coast is steep and dark in colour. This stretch of coast is broken by two valleys through the western of which flows Rechka Shelen (Shellen), and through the eastern, Rechka Voron. The village of Morskoye (Kapskhor) is situated in the western valley. On the coast between these two valleys is a dense grove of trees. 35

Kutlakhskiy coastguard station is situated on the eastern side of the mouth of Kutlakhskaya balka, about  $1\frac{1}{2}$  miles eastward of Mys Ay-Foka. Mys Chiken, about three-quarters of a mile south-eastward of this coastguard station, is composed of jagged rocks. Between Mys Chiken and Kutlakhskaya balka are a number of sharply-pointed hills. 40

Mys Khoba-Burnu (Khoba), about three-quarters of a mile eastward of Mys Chiken is flat-topped and terminates in a rounded, rocky hummock.

At the mouths of all the gullies between Mys Sotera and Mys Chiken there are sandy beaches off which, in summer, anchorage may be obtained in depths of from 15 to 20 fathoms (27m4 to 36m6), mud, or mud and shells. 45

Between Mys Khoba-Burnu and Mys Kil'se-Burnu, about 6 miles eastward, the coast curves and forms a wide bight known as Sudakskaya (Sudak) bukhta. 50

**Prohibited anchorage.**—A small area, about one mile in extent, in which anchoring and fishing are prohibited exists close southward of Mys Khoba-Burnu.

**Mys Meganom.—Light.—Fog signal.**—Mys Meganom is a very prominent, rugged headland which rises to Gora Urtany-Ustu (Arduich 55

*Chart 2233.*

Kaya), 1,160 feet (353m6) high, about one mile west-north-westward of Mys Choban-Baste (Khoban-Basti), the southern extremity of the head-lead, situated about  $1\frac{1}{2}$  miles east-south-eastward of Mys Kil'se-Burnu.

- 5 Mys Meganom is joined to the mainland by low ground and, from an offing, appears as an island. See views [25] and [26]. The headland forms the eastern side of Sudakskaya bukhta and terminates south-westward in Mys Kil'se-Burnu, the eastern entrance point of that bay. Both Mys Kil'se-Burnu and Mys Choban-Baste are steep-to.

- 10 Meganomskiy light is exhibited, at an elevation of 324 feet (98m8), from a white, octagonal, masonry tower, 41 feet (12m5) in height, situated on Mys Choban-Baste. A fog signal is sounded from a structure situated close to the lighthouse. See Appendix III.

**Sudakskaya bukhta.—Anchorages.—Light.**—Sudakskaya (Sudak)

- 15 bukhta is entered between Mys Khoba-Burnu and Mys Kil'se-Burnu ( $44^{\circ} 48' N.$ ,  $35^{\circ} 03' E.$ ) about 6 miles eastward. There are three bights or coves in the bay, each of which affords anchorage during offshore winds.

About half a mile north-eastward of Mys Khoba-Burnu, Mys Chekenyn (Chekenuin), a flat-topped point, extends about half a mile eastward

- 20 from the general line of the coast. Bukhtochka Sudak-Liman is entered between Mys Chickenyn and Gora Sokol, which rises precipitously from the coast about  $1\frac{1}{2}$  miles north-eastward. The western side of this cove rises to a sharply-pointed, conical hill which dominates Mys Khoba-Burnu and Mys Chekenyn but is lower than Gora Sokol. There are
- 25 depths of from 24 feet to 14 fathoms (7m3 to 25m6) in the cove, the nature of the bottom being mud in the greater depths and sand in the lesser.

Small craft with local knowledge can find shelter from westerly and south-westerly winds in Bukhtochka Sudak-Liman.

Sudakskiy (Sudak) reyd is entered between Gora Sokol and Mys

- 30 Alchak-Kaya (Alchak), about  $2\frac{1}{2}$  miles eastward, see view [20]. Mys Sudakskiy, about one mile eastward of Gora Sokol, rises steeply to Sudakskaya skala, a large crag with a tower on its summit and the remains of fortifications on its slopes. Mysok Khys-Kule-Burun, a small, flat and rocky point, projects into the roadstead close northward of Mys
- 35 Sudakskiy.

Between Mys Sudakskiy and Mys Alchak-Kaya there is a low beach on which is a row of houses, standing at the mouth of Sudakskaya dolina, a wide valley through which flows Rechka Taraktash.

- There is a coastguard station at the mouth of Rechka Soük-Su, a small
- 40 stream which flows into the roadstead about one mile north-westward of Mys Alchak-Kaya.

Sudakskiy light is exhibited, at an elevation of 46 feet (14m0), from a black pyramidal structure, 14 feet (4m3) in height, situated at the head of Sudakskiy reyd, close to the coastguard station.

- 45 The best anchorage in Sudakskiy reyd is in depths of from 13 to 14 fathoms (23m8 to 25m6), sand and mud, with the tower on Sudakskaya skala bearing  $335^{\circ}$ . Within this berth, on a line joining Gora Sokol and Mys Alchak-Kaya, there is a depth of 66 feet (20m1), mud, sand and shells; closer inshore the bottom is clean sand.

- 50 Sudakskiy reyd is sheltered from west, through north, to east. Swell sets in from south-eastward and, on account of an east-going eddy in the roadstead, vessels are liable to ride beam on to it.

The bight comprising the eastern part of Sudakskaya bukhta is entered between Mys Alchak-Kaya and Mys Kil'se-Burnu. Its shore, which is

55 uninhabited, consists of low, flat points, between which are sandy beaches.

During winds from between east and north-east, good anchorage

*Chart 2233.*

may be obtained in the eastern part of this bight, in depths of from 12 to 15 fathoms (21m9 to 32m8), sand and mud.

**Sudak.—Light.—Storm signals.—Port facilities.**—The town of Sudak (44° 51' N., 34° 59' E.), which is the seat of local government, is situated in Sudakskaya dolina, about one mile inland from the head of the bay. This valley is only open southward and the climate is mild even in winter. There is a hospital in the town. In 1931, the population of the town was about 2,500.

A small pier, with depths of from 5 to 6 feet (1m5 to 1m8) alongside and a crane at its head, projects from the shore abreast the town. A light is occasionally exhibited from the pier.

Storm signals, *see* page 18, are displayed from a mast.

Limited supplies of provision may be obtained.

There is regular sea communication with other U.S.S.R. ports in the Black sea.

**Life-saving.**—A lifeboat is stationed near Mys Sudakskiy; *see* page 25.

**MYS MEGANOM TO MYS IL'I.—Aspect.**—Gora Eski-Dag (Echki Dag) or Chalka rises to an elevation of 2,100 feet (640m1) about 7 miles northward of Mys Meganom. It has three summits of which the central one is a blunt, tree-covered cone and the other two are more pointed and bare. These peaks are visible from all directions.

Gora Kara-Dag or Chernaya, about 4½ miles east-north-eastward of Gora Eski-Dag, rises from the sea in a series of irregular, jagged cliffs to a dark-coloured summit, 1,890 feet (576m1) high. *See* view [26].

**Mys Choban-Baste to Bukhta Koktebel'.—Coast.—Anchorage.**—From Mys Choban-Baste the coast trends east-north-eastward for about 1½ miles to Mys Kopsel', the south-eastern extremity of Mys Meganom, and thence north-eastward for a similar distance to a point on the northern side of which is Kozskaya dolina, a valley with a sandy beach at its mouth. This stretch of coast consists of completely bare, massive cliffs but, north-eastward of Kozskaya dolina, low clay hills extend along the coast as far as the foothills of Gora Eski-Dag.

Otuzskaya rechka flows down Otuzskaya dolina and into the head of a small bight about 3 miles eastward of the summit of Gora Eski-Dag; there are several houses and orchards near its mouth. A reddish-coloured, conical peak, situated a short distance inland, dominates the valley, and, farther inland, is a bare hill with twin peaks.

Anchorage may be obtained, in a depth of 12 fathoms (21m9), mud and shells, abreast the mouth of Otuzskaya rechka. Closer inshore there are depths of 48 feet (14m6), mud.

From the mouth of Otuzskaya rechka the coast trends eastward and north-north-eastward for about 3 miles to the western entrance point of Bukhta Koktebel'.

**Prohibited anchorages.**—Anchoring and fishing are prohibited in an area, indicated on the chart, about 5 miles north-eastward of Mys Meganom; *see* "LAWS AND REGULATIONS APPERTAINING TO NAVIGATION" on page 1. Another area, not indicated on the chart, about 3½ miles in extent, in which anchoring and fishing are prohibited, lies close north-eastward of the first area here described and extends north-eastward to the southern approach to Bukhta Koktebel'.

**Bukhta Koktebel'.—Lights.—Dangers.—Anchorage.**—Bukhta Koktebel' is entered between the coast at the foot of the eastern slopes of Gora Kara-Dag and the southern extremity of Mys Kiik-Atlama (44° 57' N., 35° 25' E.), about 5½ miles eastward. The western shore

*Chart 2233.*

of the bay is backed by bare, reddish-coloured hills and the village of Koktebel' stands about half a mile within the head of the bay.

- 5 Mys Kiik-Atlama extends about 2 miles south-eastward from the general line of the coast and terminates in a hummock with steep sides, 580 feet (176m7) high, which is connected to the coast north-westward by a low isthmus and, from an offing, appears as an island. Ivan-Baba, a detached rock, on the summit of which is a stone chapel, lies close off the north-eastern extremity of the cape. *See* view [26]

- 10 A light is exhibited, at an elevation of 525 feet (160m0) from a grey concrete column having a grey rectangular daymark with a white band, 20 feet (6m1) in height, situated on Mys Kiik-Atlama.

- Two small points extend southward from the northern shore of Bukhta Koktebel', about 3 miles west-north-westward, and 4 miles westward, 15 respectively, of Mys Kiik-Atlama. Mys Toprak-Kaya, the western point, is bold and moderately high. A group of rocks with depths of from 3 to 8 feet (0m9 to 2m4) over them, lies between 5 and 7 cables westward of Mys Toprak-Kaya and as much as  $4\frac{1}{2}$  cables offshore. Tash-Tepe, two large, white, above-water rocks with several smaller rocks 20 round them, lie about half a mile east-south-eastward of Mys Toprak-Kaya.

- Near the north-western corner of the bay, about one mile north-north-westward of its western entrance point, is a gorge in which is a mine. A pier, with depths of 15 feet (4m9) off its head, extends from the shore at the mouth of the gorge and is used in connection with the mine. 25 In 1940, a channel was blasted through the submerged rocks in the approach to the pier and vessels of a draught not exceeding 12 feet (3m7) can proceed to the pier. The area for turning off the pier is restricted and vessels should keep strictly to the line of the leading lights, *see* below, when approaching it.

- 30 A group of rocks, with a least depth of 28 feet (8m5) over it, lies about  $4\frac{1}{2}$  cables east-north-eastward of the pier head.

- Leading light-beacons, from which lights are exhibited on request, have been established for the approach to Bukhta Koktebel'. The front light is exhibited, at an elevation of 52 feet (15m8), from a white, rectangular 35 beacon with a black stripe, 13 feet (4m0) in height, situated near the coast about one mile north-north-eastward of the pier head; the rear light is exhibited, at an elevation of 128 feet (39m0), from a similar beacon about  $4\frac{1}{2}$  cables north-westward of the front beacon. These light-beacons in line, bearing 326°, lead into Bukhta Koktebel' to the leading line of 40 the pier approach channel.

- Leading light-beacons have been established for the approach channel to the pier. The front light is exhibited, at an elevation of 24 feet (7m3), from a white, rectangular shield with a black stripe, surmounted by a triangle, point up, 12 feet (3m7) in height, situated on the head of the 45 pier; the rear light is exhibited, at an elevation of 36 feet (11m0), from a similar beacon, surmounted by a triangle, point down, situated on the hillside about  $1\frac{1}{2}$  cables west-north-westward of the front light. These lights in line, bearing 296°, lead to the pier.

- Anchorage, with shelter from winds from south-south-west, through 50 north, to east, may be obtained in depths of about 5 fathoms (9m1), in the north-western corner of the bay.

**Local magnetic anomaly.**—A local magnetic anomaly is stated to exist in the vicinity of Bukhta Koktebel'.

- Dvuyakornaya bukhta.**—**Navigational aids.**—Dvuyakornaya bukhta 55 or Port Genuetsev is entered between Mys Kiik-Atlama (44° 57' N., 35° 24' E.) and Mys Il'i (St. Ili), about 4 miles east-north-eastward.

*Chart 2233.*

This bay, and an area in its approach, the eastern limit of which is marked by seven buoys with red flags, is closed to navigation.

Mys Il'i (St. Elias) is high and bluff. It is fringed by a rocky bank which extends about  $1\frac{1}{2}$  cables east-south-eastward, and one cable north-ward from it. *See* view [27]. A white chapel stands at an elevation of about 400 feet (121m9) on the summit of a cliff about 6 cables westward of the extremity of the cape. 5

Il'inskiy light is exhibited at an elevation of 216 feet (65m8), from a round brick tower, 49 feet (14m9) in height, situated on Mys Il'i. 10

A radiobeacon transmits from the lighthouse.

A range of hills named Biyuk-Yanyshar extends west-north-westward from the isthmus within Mys Kiik-Atlama and rises to an elevation of 770 feet (234m7) about 3 miles from that cape. Another range of hills extends westward from Mys Il'i and rises to an elevation of 990 feet (301m8) in Gora Teze-Oba (Tete-Oba), about  $2\frac{1}{2}$  miles westward from it. There is a row of buildings at the head of the bay and behind them, a valley extends west-north-westward between the two ranges. 15

About three-quarters of a mile westward of Mys Kiik-Atlama is a cove, open north-westward, which extends about a quarter of a mile inland and is about half a mile wide at its entrance. There are depths of from 36 to 42 feet (11m0 to 12m8), sand and mud, at its entrance and from 18 to 24 feet (5m5 to 7m3) about one cable from its head. 20

**FEODOSIYSKIY ZALIV. — Aspect. — Dangers. — Light.**—Feodosiyskiy zaliv (Gulf of Theodosia) is entered between Mys Il'i ( $45^{\circ} 01' N.$ ,  $35^{\circ} 26' E.$ ) and Mys Chauda, about 17 miles eastward. It has convenient depths for anchorage. 25

The north-western shore of the gulf is low and sandy but the north-eastern shore is bold. Except near the town of Feodosiya (Theodosia), in the western corner of the gulf, the coastal area is bare and sparsely inhabited and that part within its north-eastern shore is quite barren. 30

Mys Chauda is the western extremity of a low, flat and bluff headland. The headland is fringed by a narrow reef, and another reef, with depths of less than 30 feet (9m1) over it, extends about three-quarters of a mile south-westward from a point about  $1\frac{1}{2}$  miles north-westward of Mys Chauda. Except for these reefs, the shores of the gulf are clear of dangers and may be safely approached. 35

A black barrel mooring buoy lies about 2 miles west-north-westward of Mys Chauda.

Chaudinskiy light is exhibited, at an elevation of 121 feet (36m9), from a white, octagonal tower and dwelling, 37 feet (11m3) in height, situated about a quarter of a mile within Mys Chauda. 40

**Prohibited area.**—Navigation is prohibited in an area bounded by the following points:—From a position about 4 miles westward of Mys Kiik-Atlama in a south-south-westerly direction for 2 miles; thence south-eastward for  $4\frac{1}{2}$  miles and thence south-westward to the shore. 45

Another similar area is bounded by the following points:—From Mys Chauda in a west-north-westerly direction for 12 miles and thence northward to the shore.

**Feodosiyskaya bukhta. — Anchorage.**—Feodosiyskaya bukhta, which forms the western corner of Feodosiyskiy zaliv, is entered north-westward of Mys Feodosiya ( $45^{\circ} 01' N.$ ,  $35^{\circ} 26' E.$ ), a high, bluff point situated about 9 cables north-westward of Mys I'li; Feodosiyskiy port, an artificial harbour, is situated at the head of the bay. 50

On rounding Mys I'li to proceed to an anchorage off the harbour, the 55



*Chart 2233.*

best landmarks are the cathedral and Georgiyevskiy former monastery, now a sanatorium, which are situated about one mile, and 1½ miles, respectively, westward of Mys Feodosiya, and both of which may be identified by their copper domes. A large white, square tower near Tuplinskiy monastery, about 9 cables northward of Georgiyevskiy monastery, is also a good mark.

Feodosiyskaya bukhta affords anchorage anywhere, in depths of from 60 feet to 12 fathoms (9m1 to 21m9), soft mud. The roadstead abreast the harbour has good holding ground and is sheltered from all winds except those from eastward. Easterly winds send in a heavy swell which, however, is not dangerous.

The usual anchorage is north-eastward of the head of Zashchitnyy mol, a breakwater which forms the eastern side of the harbour, in depths of 48 feet (14m6), mud or mud and shells. On account of the tenacious quality of the mud, vessels making a long stay should sight the anchor occasionally.

Vessels in quarantine anchor eastward of Zashchitnyy mol, abreast the quarantine buildings, in depths of from 30 to 48 feet (9m1 to 14m6).

**Range of water level.**—Southerly winds raise, and northerly winds lower the water level by as much as 2 feet (0m6); in consequence, the level is high in summer and low in winter.

**Feodosiyskiy port.**—**Navigational aids.**—**Quays.**—Feodosiyskiy port is formed by two moles, of which Zashchitnyy mol, the eastern, is about 3½ cables, and Shirokiy mol, the western, about 2½ cables in length. In 1965 there were depths of between 20 and 26 feet (6m1 and 7m9) in the harbour, except in the south-eastern corner where there were depths of 10 feet (3m1).

A light is exhibited, at an elevation of 43 feet (13m1), from a white truncated pyramid 32 feet (9m8) in height, situated at the head of Zashchitnyy mol. A fog signal is sounded from a position near the light-structure.

Two lights, disposed vertically, are exhibited, at an elevation of 31 feet (9m4), from each of two white masts, 24 feet (7m3) in height, situated at the northern and southern corners, respectively, of the head of Shirokiy mol.

The sides of Shirokiy mol are quayed; weather permitting, vessels not exceeding 23 feet (7m1) in draught can berth alongside the outer 392 feet (119m5) of the northern side of this mole. The head of Shirokiy mol, which is 350 feet (106m7) in length, can accommodate vessels of a draught not exceeding 19 feet (5m8).

Soyuznefti oil fuel pier, with a depth of 18 feet (5m5) at its head, projects from the shore of Feodosiyskaya bukhta about 1½ miles northward of the root of Shirokiy mol.

A light is exhibited, at an elevation of 15 feet (4m6), from a framework pylon on the head of Soyuznefti pier ( $45^{\circ} 03' N.$ ,  $35^{\circ} 25' E.$ ).

Leading lights, in line bearing  $335\frac{1}{2}^{\circ}$ , are exhibited in this vicinity.

**Pilotage.**—Pilotage is compulsory for foreign merchant vessels. A pilot is stationed in the town.

**Harbour regulations.**—The following are extracted from the "Obligatory regulations in force in Feodosiyskiy Commercial Port"; Masters of vessels should obtain a complete copy of the regulations on arrival.

Every vessel entering or leaving the port must display her national flag by day, and exhibit the regulation lights from sunset to sunrise.

All merchants vessels arriving in the port will be assigned a berth in the order of arrival.

**Chart 2233.**

When approaching a dredger a vessel must slow down and sound a prolonged blast on her siren. The dredger will show on the side which is clear two balls, or two *white* lights, disposed vertically.

Vessels entering the port must give way to vessels leaving it. 5

Vessels must proceed at a slow speed when within the limits of the port.

Vessels are not to anchor in the fairway of the harbour and roadstead.

Vessels are not allowed to enter the harbour until the permission of the Port Authorities has been obtained. 10

Vessels which would have less than one foot (0m3) under their keels are forbidden to enter the harbour or to go alongside or leave the quays.

Vessels arriving in the port with explosives must not go alongside the quays, but anchor in the roadstead or basin.

Vessels lying alongside the quays must exhibit stay lights from sunset 15 to sunrise, and show a light at the gangway to the quay.

Vessels in the port are forbidden to carry out extensive external repairs without permission from the Port Authorities, who, in case of necessity, will indicate the proper place for this work to be done.

**Quarantine.**—Feodosiya is a quarantine station for vessels bound from 20 infected ports to U.S.S.R. ports in the Black sea. The quarantine buildings are situated in the eastern part of the town.

**De-ratting.**—De-ratting can be carried out, *see* page 27.

**Town.**—**Port facilities.**—**Storm signals.**—**Radio station.**—The town of Feodosiya (Theodosia) ( $45^{\circ} 02' N.$ ,  $35^{\circ} 24' E.$ ), with a population, 25 in 1930, of 29,600, is situated partly on the low shore at the head of Feodosiyskaya bukhta and partly on the slopes of Gora Teze-Oba. There is an infirmary in the town.

Fuel oil may be obtained by vessels of a draught not exceeding 18 feet 30 (5m5) at Soyuznefti oil fuel pier.

Provisions and fresh water are available.

Repairs to vessels of moderate size can be undertaken. There is a mobile 8-ton crane in the port.

All the quays are connected with the general railway system.

Storm signals, *see* page 18, are displayed from a mast situated near 35 the light-structure at the head of Zashchitnyy mol.

There is regular sea communication with other U.S.S.R. ports in the Black sea and Sea of Azov.

There is a radio station at Feodosiya, *see* page 26.

**Charts 2216, 2233.** 40

**MYS CHAUDA TO MYS OPUK.**—**Aspect.**—From Mys Chauda ( $45^{\circ} 00' N.$ ,  $35^{\circ} 50' E.$ ) (page 293), the coast trends in a general easterly direction for about 17 miles to Mys Opuk and is low with several hills rising within it.

From eastward, Mys Chauda may be identified by its lighthouse and 45 by Kholm Dyurmen', a rounded hill, 340 feet (103m6) high, which appears to be connected with Mys Chauda, but actually lies about  $5\frac{1}{2}$  miles east-north-eastward of it and about 2 miles inland. As this hill is opened eastward of the cape, it presents a more conical appearance; the village of Karan-Gat, situated at the foot of its south-eastern slopes, 50 is visible from seaward.

When eastward of Kholm Dyurmen', Kholm Kinchigir' (Konchak), 380 feet (115m8) high, will be seen and may be identified by its irregular surface. Kholm Kinchigir' lies about 5 miles west-north-westward of 55 Mys Opuk and a village can be seen on its eastern slopes. A half-ruined

*Charts 2216, 2233.*

house standing near the coast about  $4\frac{1}{2}$  miles westward of Mys Opuk, was a good landmark in 1946.

- 5 Gora Opuk rises to an elevation of 630 feet (192m0), about one mile northward of Mys Opuk; its summit is flat and covered with rocky projections which resemble fortifications, and its landward slope is much steeper than that seaward.

- 10 Kholm Dyurmen', Kholm Kinchigir', and Gora Opak are the only identifiable natural features between Mys Chauda and Mys Takil', see page 301, about 27 miles east-north-eastward.

- Coast.—Anchorage.—Off-lying dangers.—Light.—From Mys Chauda the coast trends eastward to a small point (Dyurmen point), and thence forms a slight bight between this latter point and Mys Opuk. There is a pier at the head of this bight, about 5 miles east-north-eastward of the western entrance point, and another pier is situated about 5 miles farther eastward. A narrow neck of land separates Ozero Uzunlarakoye (Lake Uzunlar) from the sea about one mile eastward of this pier. Ozero Kayasskoye (Lake Elten) lies about  $2\frac{1}{2}$  miles farther eastward.

- 20 In 1848, the Russian Naval Storeship *Abin*, with a draught of  $11\frac{1}{2}$  feet (3m5), was reported to have been lost on a sunken rock about  $1\frac{1}{2}$  miles southward of the point about 5 miles eastward of Mys Chauda. Searches for this rock in 1873, 1874 and in recent years have failed to find it and its position is doubtful.

- 25 Skala Korabl'-kamen' (Kamni El'chan kaya) ( $45^{\circ} 01' N.$ ,  $36^{\circ} 10' E.$ ), a group of four high rocks, lies about  $2\frac{1}{2}$  miles west-south-westward of Mys Opuk. When seen from westward or eastward, the largest of these rocks resembles a schooner under sail, but from southward, appears as a sloping column. In the fairway between Skala Korabl'-kamen' and Mys Opuk, there are depths of from 30 to 42 feet (9m1 to 12m8). See view [28].

- 30 The southern part of Skala Korabl'-kamen' is covered by the green flashing sector of Kyz-Aul'skiy light (page 300) between the bearings of  $060^{\circ}$  and  $070^{\circ}$ .

- Prohibited area.—Navigation is prohibited in an area extending for about 10 miles offshore between Mys Chauda and Mys Kyz-Aul (page 35 300). Attention is drawn to "LAWS AND REGULATIONS APPERTAINING TO NAVIGATION" on page 1.

- Current.—The general current of the main Black sea circulation, supplemented by water from the Sea of Azov, sets fairly strongly south-westward at times, depending on the strength of the easterly wind. Off 40 Mys Chauda, an inshore set is sometimes experienced. (See page 279.)

COAST.—The coast eastward of Mys Opuk is described on page 300.

## CHAPTER VIII

## KERCHENSKIY PROLIV

*Charts 2216, 2233.*

**KERCHENSKIY PROLIV.**— **General remarks.**— **Aspect.**— **Beacons.**—Kerchenskiy proliv separates the eastern end of the Crimea from Tamanskiy poluostrov and connects the Black sea with the Sea of Azov. This strait varies much in width and is encumbered by extensive shallow banks and shoals through which a narrow channel called Kerch'-Yenikal'skiy kanal has been dredged. This channel was dredged to a depth of 27 feet (8m2) in 1967. 5

On both sides of the strait there are fairly high uplands rising, in places, to hills which terminate at its shores in bluffs and cliffs. Between these hills there are low-lying areas with marshes and lakes. 10

Gora Khroni ( $45^{\circ} 23' N.$ ,  $36^{\circ} 36' E.$ ), consisting of a ridge rising to a conspicuous peak, 574 feet (175m0) high, at its eastern end, lies near the western side of the northern entrance of the strait and is visible from its southern entrance. There is a wooden pyramidal-shaped beacon on the summit; its charted position is approximate. 15

Gora Gorelaya, on the eastern side of the strait, about 10 miles east-south-eastward of Gora Khroni, has a conical summit, 341 feet (103m9) high, and is conspicuous from all parts of the strait. A wooden pyramidal-shaped beacon surmounted by a ball, stands on its summit. 20

Mys Takil', Mys Belyy, Mys Yenikale, Mys Fonar' and Mys Khroni, on the western side, and Mys Panagiya and Mys Akhilleon on the eastern side, all provide excellent marks for a vessel proceeding through the strait in either direction.

**Railway-ferry crossing.**—**Speed and anchorage prohibition.**— **Regulations.**—An area in which special regulations are in force, in connection with a railway-ferry which crosses the navigable channel of the northern part of the strait, lies east-north-eastward of Mys Yenikale ( $45^{\circ} 21' N.$ ,  $36^{\circ} 36' E.$ ) and is described on page 312. 25

**Recommended track for entering Kerchenskiy proliv.**—See page 305. 30

**Submarine cables.**—**Prohibited anchorages.**—A submarine cable crosses the strait between Mys Belyy ( $45^{\circ} 19' N.$ ,  $36^{\circ} 30' E.$ ) and the town of Taman', see page 318; and is indicated on the chart.

A submarine cable crosses the strait between Mys Yenikale ( $45^{\circ} 21' N.$ ,  $36^{\circ} 36' E.$ ), and the pier at Peredniy Chushkinskoye on Kosa Chushka, see page 310. A number of submarine cables cross the northern entrance of the strait between a position about 4 cables northward of Yenikal'skiy lighthouse and Kosenko farm. The landing places of these cables are marked by a number of beacons each consisting of a spar painted orange-colour and surmounted by a black cross and disc, about 36 feet (11m0) in height. Anchorage is prohibited in each of two areas, indicated by pecked lines on the chart, in the vicinity of these cables. 35 40

Anchorage is prohibited in each of two areas, the limits of which are indicated by pecked lines on the chart, situated, respectively, in the 45

*Charts 2216, 2233.*

southern entrance of the strait, and westward of Mys Khroni, described on page 310. *See also Articles 16 and 17 of the regulations, page 300.*

**Mine exercise area.**—An area about one mile in extent in which mining exercises may be carried out is situated with its centre about 4½ miles eastward of Mys Takil', the western entrance point of the southern entrance to the strait; it adjoins the southern limit of the southern prohibited anchorage referred to above.

**Ice.**—Ice occurs in the strait every year but, owing to the varying winds and current, it is never completely covered for any length of time, and the ice may break up several times during the winter. During a frost with north-easterly winds, a solid covering of ice forms in the strait and communication over it is sometimes possible southward of Kosa Tuzla.

Usually the ice appears first towards the end of December, but occasionally about the beginning of that month. The strait is normally quite clear of ice by about the end of February or the beginning of March, and, at latest, by the end of March.

When the current due to southerly winds sets into the strait from the Black sea the strait is very soon cleared of ice.

Drift-ice is most often seen when the ice breaks up in the Sea of Azov in spring, though it may appear at any time after December. This ice from the Sea of Azov generally sets through the strait in compact and, at times, very hummocky masses, which pile up on Kosa Chuhska and Kosa Tuzla. A considerable amount, however, drifts through to the southern part of the strait and into the Black sea.

Movements of ice from the Black sea to the Sea of Azov are rare.

Out of 25 winters, the first ice was observed to form once in November, 12 times in December, 11 times in January, and once in February; the earliest date of its appearance was November 23rd. In 24 winters the ice finally disappeared 3 times in January, 9 times in February, 11 times in March, and once in April; the latest date of its disappearance being April 11th.

In the winters of 1924-25, 1925-26 and 1927-28, navigation through the strait was not interrupted; in the winter of 1926-27 navigation was maintained throughout with the assistance of icebreakers when necessary.

*See also pages 27-36.*

**Currents.**—From observations covering a period of 10 years excluding the ice season, made at Tuzlinskiy light-vessel, which was formerly moored off the southern end of the dredged channel (45° 14' N., 36° 27' E.), 46 per cent, of the observations showed a current setting from the Sea of Azov; 31 per cent, a current from the Black sea; and 23 per cent, no current. The mean rate of the current setting from the Sea of Azov was from 0.59 to 0.92 knots, and of that from the Black sea, from 0.57 to 0.69 knots. In the spring, the predominance of the current from the Sea of Azov was more marked; during May this current was observed during 59 per cent, and that from the Black sea during 25 per cent of the observations, 16 per cent showing an absence of any current. The current from the Sea of Azov weakens during the summer and is at its minimum in September; that from the Black sea is at its maximum in November.

Both these currents depend more or less on the wind. That from the Sea of Azov is usually experienced with northerly and easterly winds, and that from the Black sea with southerly and westerly winds. The former current is less affected by the direction of the wind during the spring, and the latter in the autumn.

The maximum observed rate of both these currents is from 2½ to 3

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knots in the narrowest part of the strait, but in its wider parts is considerably less. In Kerchenskaya bukhta and roads the effect of the current is only noticeable by the rise and fall of the water level.

When the water has been driven out of the Sea of Azov by prolonged north-easterly winds, a countercurrent, independent of the wind, begins to be felt in the central part of the strait, causing a vessel at anchor there to lie athwart the wind and sea. After the subsidence of such winds, the current sets towards the Sea of Azov and continues until the normal water level has been re-established.

*See also page 51.*

**Range of water level.**—Strong north-easterly winds lower, and south-westerly winds raise the level of the water in the strait. A difference of as much as 3 feet (0m9) has been observed in this level.

**Local magnetic anomaly.**—A local magnetic anomaly is reported to exist in the strait.

**Caution.**—As the buoys, beacons, etc., in the area of Kerch'-Yenikal'skiy kanal are subject to constant change in character and position and as pilotage is compulsory, full details of the navigational aids are not given.

**PILOTAGE.**—The pilotage service for Kerch'-Yenikal'skiy kanal and the Sea of Azov is based on the port of Kerch' ( $45^{\circ} 21' N.$ ,  $36^{\circ} 29' E.$ ) and provides pilots for all vessels proceeding from the Black Sea to the Sea of Azov, and from the Sea of Azov to the Black Sea. Pilots for the return passage through the Sea of Azov are obtained at Zhdanov (*see* page 352).

Pilotage through Kerch'-Yenikal'skiy kanal is compulsory.

Pilots at the southern end of the channel are embarked at No. 21 light-and-siren buoy ( $45^{\circ} 13' N.$ ,  $36^{\circ} 28' E.$ ) (page 304), and at the northern end at Varzovskiy light-and-whistle buoy (page 310). Vessels should anchor in the vicinity of these buoys and await a pilot.

The pilot vessel is a white cutter and displays the flag H of the International Code of Signals.

**REGULATIONS.**—The following are extracts from the regulations:—

1. Vessels proposing to enter the Sea of Azov must inform the Captain of the Port at Kerch' by radio, 24 hours before entering the strait, of the port to which they are going and at the same time request a pilot; the exact time of arrival at the pilot station light-and-siren buoy, No. 21, should be signalled 6 hours beforehand.

2. All vessels must maintain continuous radio watch in case of receipt of information concerning changes in the channel and other communications.

3. A vessel must have at least one foot (0m3) under her keel, according to the latest depths reported in the dredged channel, before proceeding through it. If the depths are insufficient, a vessel should either unload part of her cargo, or wait at anchor for the water level to rise.

4. All vessels, without exception, when navigating the strait must display their national flag by day and exhibit regulation lights at night.

5. Vessels whose draught exceeds  $22\frac{1}{2}$  feet (6m8) must display a red ball by day, and a red light on the foremast at night, when passing through the channel. All ships give way to vessels displaying this signal.

6. Two vessels proceeding in the same direction may not enter the channel at the same time. When approaching the channel a ship being towed or a slow ship must allow the faster vessel to proceed ahead of her.

7. Overtaking in the channel is forbidden, unless the overtaken ship previously agrees by signal.

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8. All ships give way to ships drawing more than 22½ feet (6m8), and keep to the starboard side of the channel, going outside the channel limits if depths are suitable. Small tonnage vessels and vessels being towed, give way to large vessels.

9. Vessels of less than 100 tons displacement must keep outside the deep limits of Kerch'-Yenikal'skiy kanal, except where the water is shoal or there are obstructions.

10. Vessels entering the channel from the Sea of Azov, must not pass north-bound ships in Chushkinskoye koleno.

11. Vessels proceeding through Pavlovskoye koleno from the Black sea must not pass vessels coming from the opposite direction in the turn from Burunskoye koleno to Pavlovskoye koleno (45° 16½' N., 36° 27½' E.).

12. If passing in the channel vessels must reduce speed and navigate with caution, leaving each other on the port side.

13. Vessels entering the channel from ports and coastal points within the strait must give way to vessels already in Kerch'-Yenikal'skiy kanal.

14. Vessels passing dredgers in the channel must do so in accordance with the special regulations described on page 15.

15. Navigation of the channel in fog is forbidden.

16. Anchorage is permitted only in the vicinity of No. 21 light-and-siren buoy or Varzovskiy light-and-whistle buoys.

17. Anchorage is prohibited in the areas described on pages 297 to 298.

18. Anchorage is prohibited in the channel or near its navigable edges.

19. If a vessel encounters a fog when proceeding along the channel she must anchor in it, taking all precautions, and make the usual signals. She must weigh as soon as it is possible and continue on her course.

20. Every order of the port authorities, and of the Coastguard, concerning the stopping of the vessel, signified by whistle or other means, must be carried out immediately, provided the ship, by doing so, does not run the risk of running aground, collision, or blocking the channel.

21. Ships drawing more than 19½ feet (6m0) must not exceed a speed of 8 knots in the channel; ships of less draught may proceed up to 10 knots.

22. Persons responsible for the destruction or damage of any of the buoys must immediately pay for their cost or repair, as determined by the pilot master.

23. All vessels are strictly prohibited from throwing overboard any description of ashes, refuse, or ballast within the limits of the Port.

*Chart 2216.*

**SOUTHERN APPROACH TO KERCHENSKIY PROLIV:—Western side.—Dangers.—Navigational aids.—Caution.**—From Mys Opuk (45° 02' N., 36° 14' E.) page 296, the coast on the southern side of the western approach to the strait trends east-north-eastward for about 6½ miles to Mys Kyz-Aul, and thence north-eastward for about 4½ miles to Mys Takil'. There are several landslips, reddish and ash-grey in colour, along this stretch of coast. The village of Kyz-Aul is situated near the highest of these landslips where they become lighter in colour, about 2½ miles west-north-westward of Mys Kyz-Aul. This highest landslip extends eastward to Mys Kyz-Aul and forms the point. There is a small pier abreast the village of Kyz-Aul.

Kyz-Aul'skiy light is exhibited, at an elevation of 204 feet (62m2), from an octagonal tower, painted in black and white vertical stripes, 92 feet (28m0) in height, with a white, two-storeyed house close east-

**Chart 2216.**

ward of it, situated on Mys Kyz-Aul. A radiobeacon transmits from the lighthouse.

*Priyemnyy* conical light-and-siren buoy, fitted with a radar reflector and painted red with white bands, exhibiting a *red flashing* light *every two seconds*, is moored  $15\frac{1}{2}$  miles south-south-eastward of Kyz-Aul'skiy light-structure. A red can buoy, of no navigational significance, is moored  $1\frac{1}{2}$  miles south-westward of the light-and-siren buoy. 5

Banka Kyz-Aul'skaya, with a least depth of 16 feet (4m9) over it, lies from  $2\frac{1}{2}$  cables to  $1\frac{1}{4}$  miles southward and south-south-eastward of Mys Kyz-Aul. It is marked on its southern side by a red conical buoy. Should this buoy be withdrawn for any reason, it is replaced by two spar buoys, each painted red and surmounted by a red cone, point down. 10

Banka Anisimova, with a least depth of 25 feet (7m6) over it, lies about 3 miles south-eastward of Mys Kyz-Aul. A red conical light-buoy, exhibiting a *red flashing* light, is moored about 5 cables south-south-eastward of Banka Anisimova. 15

Mys Chauda (page 293), bearing about  $270^\circ$ , and open southward of Skala Korabl'-kamen' leads southward of Banka Anisimova, and the highest hill about one mile westward of Mys Belyy, *see* page 304, bearing  $003^\circ$ , and in line with Mys Takil', leads eastward of it. 20

Mys Takil' ( $45^\circ 06' N.$ ,  $36^\circ 27' E.$ ), the western entrance point of the southern entrance to the strait, is a high, rounded bluff. Bashnya Takil', a squat, white circular stone tower, stands about 4 cables westward of the point. 25

Takil'skiy light is exhibited at an elevation of 313 feet (95m4) from a metal framework structure, 35 feet (10m7) in height, situated about 3 cables west-south-westward of Mys Takil'.

Mys Takil' is fringed by a rocky bank, with depths of less than 6 feet (1m8) over it, which extends 5 cables eastward and one mile south-south-eastward from it. The eastern side of the bank is marked by a conical light-buoy, painted red and white in stripes and exhibiting a *red flashing* light *every two-and-a-half seconds*; red and white spar buoys, surmounted by broom topmarks, mark the north-eastern and south-eastern sides of the bank. Some obstructions are indicated on the chart northward of this position. *See* view [29]. 35

A red conical buoy, of no navigational significance, is moored  $1\frac{1}{2}$  miles east-north-eastward of Mys Takil' light-structure.

Vessels should give the coast a berth of  $3\frac{1}{2}$  miles when passing Mys Kyz-Aul. 40

**Light-and-whistle-buoy.**—*Kerchenskiy Proliv (south) Approach* light-and-whistle-buoy, painted black and white in bands, fitted with a radar reflector, and exhibiting a *white flashing* light, is moored about  $3\frac{1}{4}$  miles south-south-eastward of Mys Takil'.

**Caution.**—*See* prohibited area on page 296. 45

**Winds.**—**Fog.**—Off Mys Kyz-Aul north-easterly winds prevail throughout the greater part of the year, giving place in summer to south-westerly winds which blow during the day only. June is the month with least wind. Gales are mainly north-easterly and are most frequent in autumn and winter. Calms are very rare. 50

Fogs are most frequent during the spring, especially in May. They are less frequent in autumn and winter.

**Eastern side of southern approach to the strait.**—**Off-lying dangers**—**Navigational aids**—Mys Zheleznyy-Rog ( $45^\circ 07' N.$ ,  $36^\circ 44' E.$ ), the eastern entrance point of the southern entrance to Kerchenskiy 55



*Chart 2216.*

proliv is a broad, bluff, reddish-coloured headland, situated about 12 miles eastward of Mys Takil'. A wooden framework lookout tower stands on the cape and a short distance eastward of it is Neftyanoy coastguard station.

A light is exhibited from a triangular pyramid, situated on Mys Zheleznyy-Rog. A radiobeacon transmits near the light-structure.

Rif Kishla, a ridge of sharply-pointed, submerged rocks, with depths of from 5 to 23 feet (1m5 to 7m0) over them, extends about 2 miles south-eastward from a position about 8 cables south-westward of Mys Zheleznyy-Rog; its south-western edge is steep-to. A light-buoy, painted red and white in bands and exhibiting a *red flashing* light showing a *short flash every five seconds*, marks the north-western extremity, and a red spar buoy surmounted by a cone, point down, marks the southern extremity of Rif Kishla.

Banka Chernysheva, with an obstruction close westward of it, lies close south-eastward of the south-eastern extremity of Rif Kishla and about  $2\frac{1}{2}$  miles south-eastward of Mys Zheleznyy-Rog and is the outermost danger in this direction.

A 20-foot (6m1) patch lies about  $4\frac{1}{2}$  miles south-westward of Mys Zheleznyy-Rog and is the outermost danger in this direction. Its southern side is marked by a red conical light-buoy exhibiting a *red flashing* light.

Between the 20-foot (6m1) patch and Rif Kishla are Banka Savenko, Banka Andreyeva and Banka Vol'skogo, three rocky patches with depths of 30, 28 and 13 feet (9m1, 8m5 and 4m0), respectively, over them.

Two more rocky patches, Banka Aksenova (S.E.), with a least depth of 14 feet (4m3), and Banka Aksenova (N.W.), with a least depth of 27 feet (8m2), lie, respectively, about  $3\frac{1}{2}$  miles south-westward, and 4 miles westward of Mys Zheleznyy-Rog. The north-western patch is the outermost danger in that direction.

Mys Tuzla, *see* page 303, bearing  $343^\circ$  and open westward of Mys Panagiya (page 303), leads westward of all the above dangers off Mys Zheleznyy-Rog. All these dangers are covered by the *red* sector of Kyz-Aul'skiy light between the bearings of  $253^\circ$  and  $274^\circ$ .

Numerous obstructions off-lie this stretch of coast; for these, the chart is the best guide.

**SOUTHERN PART OF KERCHENSKIY PROLIV.—Dredged channel.**—Kerch'-Yenikal'skiy kanal, the dredged channel through the strait which is marked by buoys starts about 8 miles northward of Mys Takil', is referred to on page 297 and is described on pages 306 and 311.

**Coast.—Dangers.—Obstructions.—Navigational aids.—Western side.**—From Mys Takil' ( $45^\circ 06' N.$ ,  $36^\circ 27' E.$ ) the western side of the straits trends north-north-westward for about  $3\frac{1}{2}$  miles to Mys Malyy and is reddish in colour. This stretch of coast is indented by two valleys near the northern of which is Yanysh-Takil' pier, which has a depth alongside of 12 feet (3m7). Mys Malyy does not project from the general line of the coast but may be identified by the termination of the cliffs which extend between it and the northern of the two valleys mentioned above, and by a sandy beach which commences on its northern side.

Several obstructions, the outer with a depth of only one foot (0m3) over it and 6 cables offshore, lie within  $1\frac{3}{4}$  miles northward of Mys Takil'; a detached 7-foot (2m1) patch lies 3 cables offshore about 2 miles north-north-westward of the same point.

The coastal bank off Mys Malyy extends 6 cables seaward with a depth

*Chart 2216.*

of 3 feet (0m9) at its extremity. Several obstructions lie 2 miles north-eastward and one mile northward of Mys Malyy.

From Mys Malyy, a narrow sandy isthmus, within which lies Ozero Tobechikskoye, trends northward for about one mile. There are some oil wells near the southern shore of this lake. 5

**Eastern side.**—From Mys Zheleznyy-Rog ( $45^{\circ} 07' N.$ ,  $36^{\circ} 44' E.$ ) the eastern side of the strait trends west-north-westward for about  $4\frac{1}{2}$  miles to Mys Panagiya, which may be identified by a group of large above-water rocks lying close off it and also by Gora Zelenskogo, which rises to an elevation of 450 feet (137m0), about  $2\frac{1}{2}$  miles eastward of it. See view [29]. 10

Several submerged rocks, with depths of less than 5 feet (1m8) over them, lie up to a quarter of a mile off Mys Zheleznyy-Rog, and spits, with depths of less than 18 feet (5m5), extend about half a mile offshore, about  $1\frac{1}{2}$  and  $2\frac{1}{2}$  miles, respectively, west-north-westward of the same point. 15

A light is exhibited on Mys Panagiya. Numerous obstructions, and Rif Trutayeva with a depth of 3 feet (0m9) over it, lie nearly 2 miles westward of the light-structure; the outermost obstruction is marked on its north-western side by a spar buoy, painted black and white and surmounted by two cones, bases together. A detached rock, with a depth of less than 6 feet (1m8) over it, lies  $1\frac{1}{2}$  miles offshore 2 miles north-westward of the light-structure. 20

A red conical buoy, of no navigational significance, is moored  $3\frac{1}{2}$  miles westward of Mys Panagiya light-structure. 25

From Mys Panagiya the coast trends north-north-westward for about  $3\frac{1}{2}$  miles to Mys Tuzla, a bluff point on which there is a wooden lookout tower. About midway along this stretch of coast is a large hummock about 130 feet (39m6) high. A reef of above-water and sunken rocks, with depths of less than 6 feet (1m8) over it, extends about three-quarters of a mile offshore from a position about  $1\frac{1}{2}$  miles south-south-eastward of Mys Tuzla; there is an obstruction over which the depth is not known, about half a mile west-south-westward of the outer end of this reef. 30

A reef of submerged rocks with depths of less than 6 feet (1m8) extends about 6 cables westward from Mys Tuzla; an obstruction with a depth of 12 feet (3m7) over it lies about 2 cables north-westward of its outer extremity and is marked by a spar buoy, painted black and white and surmounted by two cones, bases together. A 6-foot (1m8) obstruction is situated 4 cables northward of the 12-foot (3m7) obstruction. 35

A number of obstructions, with depths of from 12 to 29 feet (3m7 to 8m8) over them, lie between three-quarters of a mile and  $1\frac{1}{2}$  miles offshore, between Mys Zheleznyy-Rog and Mys Tuzla. 40

**Western side (continued).**—From the northern end of the isthmus separating Ozero Tobechikskoye from the strait, the western shore trends northward for about  $3\frac{1}{2}$  miles to Mys Kamysh-Burnu, and consists of a low, sandy beach rising to hills within it. The iron piles of a ruined pier project above water about one mile south-south-westward of the cape. 45

Mys Kamysh-Burnu, a bluff 91 feet (27m7) high, is similar in appearance to Mys Malyy, it lies at the north-eastern end of some hills which extend inland in a west-north-westerly direction, and northward of which is a sandy plain lying between the coast and Ozero Churubashskoye, about  $1\frac{1}{2}$  miles inland. On this plain are numerous stone buildings and a fish cannery. 50

Leading light-structures for Burunskoye koleno of the dredged channel, which are situated westward and south-westward of Mys Kamysh-Burnu, are described on page 307. 55

*Chart 2216.*

No. 21 conical light-and-siren buoy, painted black and exhibiting a *white flashing* light showing a *short flash every three seconds*, is moored about  $2\frac{1}{2}$  miles south-eastward of Mys Kamysh-Burnu, and marks the eastern side of the entrance to Kerch'-Yenikal'skiy kanal, *see* page 306. It also marks the position where vessels entering Kerch'-Yenikal'skiy kanal should embark pilots. *See* page 299.

Kamysh-Burunskaya bukhta is entered northward of a point about  $2\frac{1}{2}$  miles north-north-eastward of Mys Kamysh-Burnu ( $45^{\circ} 14' N.$ ,  $36^{\circ} 25' E.$ ). The northern side of this bay rises in high, crumbling cliffs to elevated ground which terminates eastward in Mys Pavlovskiy and Mys Belyy situated, respectively, about 5 to 6 miles north-eastward of Mys Kamysh-Burnu.

The nature of the bottom in Kamysh-Burunskaya bukhta is mud and shells but it is reported that detached submerged rocks may exist near its shores which should not be closely approached. A 5-foot (1m5) patch lies about 2 cables offshore about 6 cables west-north-westward of the southern entrance point of the bay.

Leading light-structures for Yenikal'skoye koleno of the dredged channel, which are situated south-south-westward of the head of Kamysh-Burunskaya bukhta, are described on page 311.

A wooden, pyramidal beacon surmounted by a ball, stands on the summit of a hill, 364 feet (110m9) high, in Kerchenskaya fortress, about half a mile north-westward of Mys Pavlovskiy. A conspicuous clock tower is situated 3 cables north-westward of the point.

Leading light-structures for Pavlovskoye koleno, the southernmost reach of Kerch'-Yenikal'skiy kanal, which are situated westward and west-north-westward of Mys Pavlovskiy, are described on page 306.

Kamysh-Burunskiy port, situated at the head of Kamysh-Burunskaya bukhta, is described on page 307.

Mys Pavlovskiy is bluff and rises in whitish cliffs which are prominent from the southern entrance to the strait. Between Mys Pavlovskiy and Mys Belyy there is a small cove protected by a breakwater which extends about 2 cables east-north-eastward from the former cape.

Ak-Burunskiy rif, with depths of less than 12 feet (3m7), extends eastward from the coast between Mys Pavlovskiy and Mys Belyy, its eastern extremity lying about  $8\frac{1}{2}$  cables eastward of the latter cape. The southern side of Ak-Burunskiy rif is marked by two red conical buoys, each with a red spar buoy surmounted by a cone, point down, moored close to it. The eastern extremity of the reef is marked by spar buoys and by Ak-Burunskiy light-buoy No. 14 which also marks the north-western side of the dredged channel and is described on page 311.

There are three groups of detached submerged rocks on Ak-Burunskiy rif. The first group, with a least depth of 4 feet (1m2) over it, lies about 5 cables east-north-eastward of Mys Pavlovskiy; the second group, with depths of from 5 to 6 feet (1m5 to 1m8) over it, lies about 3 cables eastward of Mys Belyy; and the third group, with a least depth of 4 feet (1m2) over it, lies about  $6\frac{1}{2}$  cables eastward of Mys Belyy. Each of these groups is marked on its eastern side by a red and white spar buoy surmounted by two cones, points together. There is a channel between the second and third groups of rocks, which is available to small craft not exceeding 9 feet (2m7) in draught.

**Eastern side (continued).**—Kosa Tuzla, a sandy spit only just above water, extends about  $6\frac{1}{2}$  miles north-westward from the eastern side of the strait about one mile northward of Mys Tuzla. A swashway, on which stand 6 dolphins, crosses Kosa Tuzla near its root, but the depths in it

*Chart 2216.*

are decreasing yearly. Tuzlinskiy beacon ( $45^{\circ} 15' N.$ ,  $36^{\circ} 34' E.$ ) a white, pyramidal structure surmounted by a ball, 59 feet (18m0) in height, stands on Kosa Tuzla about  $3\frac{1}{2}$  miles north-north-westward of Mys Tuzla.

A flat which is almost awash and on which there is a sunken stone barrier, extends about  $1\frac{1}{2}$  miles north-westward from the extremity of Kosa Tuzla, narrowing the distance between it and Mys Pavlovskiy to a width of about half a mile. *Tuzlinskiy* light-buoy No. 15 painted black with a white horizontal band and exhibiting a *white flashing* light showing a *short flash every one-and-a-half seconds*, marks the north-western extremity of this flat. *Tuzlinskiy* No. 16 light-buoy, painted red with a white band and exhibiting a *red flashing* light *every one-and-a-half seconds*, is moored one cable north-westward of No. 15 light-buoy.

Tuzla banka, an extensive bank with depths of less than 18 feet (5m5), extends about  $1\frac{1}{2}$  miles westward, and about 3 miles south-westward from the extremity of Kosa Tuzla. An obstruction, over which there is a depth of 12 feet (3m7), lies close off the western edge of this bank, about 2 miles westward of the extremity of Kosa Tuzla, and a 10-foot (3m0) patch lies on the bank about  $1\frac{1}{2}$  miles south-westward of the same extremity. Gora Temiroba (page 321), situated about  $5\frac{1}{2}$  miles north-north-eastward of Mys Belyy, bearing  $023^{\circ}$  and in line with that cape, leads westward of this bank but passes close westward of the 12-foot (3m7) obstruction.

Nizhniy Pavlovsky light-structure, described on page 306, in line with a 291-foot (88m7) beacon which stands about one cable north-north-westward of it, bearing  $341^{\circ}$ , leads over the south-western extremity of Tuzla banka and over a 15-foot (4m6) patch situated  $3\frac{1}{2}$  miles west-north-westward of Tuzlinskiy beacon. This patch is marked by a spar buoy surmounted by two cones, bases together, moored one cable east-south-eastward of it; an obstruction lies  $3\frac{1}{2}$  cables south-eastward of the patch.

The meeting of the current setting westward along the Caucasian coast and that setting out of the Sea of Azov, *see* pages 51 and 298, causes a considerable deposit of silt westward of the extensive bank.

There are numerous other obstructions in the strait, the positions of which may be seen on the chart.

**Off-lying danger.**—A 21-foot (6m4) shoal, marked on its northern side by a spar buoy surmounted by a ball and cross, lies about 4 miles westward of Mys Tuzla ( $45^{\circ} 12' N.$ ,  $36^{\circ} 36' E.$ ).

**Spoil grounds.**—**Buoyage.**—A former spoil ground, indicated on the chart, lies on the western side of the southern half of Kosa Tuzla, its south-western corner being  $2\frac{1}{2}$  miles westward of the southern extremity of this spit. A spoil ground extends nearly one mile westward from the western side of the former spoil ground, and three-quarters of a mile southward from its south-western corner.

A light-buoy, painted red and white in bands and exhibiting a *green flashing* light *every three seconds*, is moored one cable within the western limit of the spoil ground,  $2\frac{1}{2}$  miles west-south-westward of Tuzlinskiy beacon.

**Anchorage.**—Anchorage in the southern part of Kerchenskiy proliv is permitted only in the vicinity of No. 21 light-and-siren buoy; *see* pages 300 and 304.

**DIRECTIONS FOR APPROACHING KERCH'-YENIKAL'SKIY KANAL FROM SOUTHWARD.**—The recommended track for vessels entering Kerch'-Yenikal'skiy kanal leads from the position Lat.  $44^{\circ}$

**Chart 2216.**

- 10-1' N., Long. 36° 29-6' E., northward to Priyemniy light-and-siren buoy, fitted with a radar reflector, moored 15½ miles south-south-eastward of Kyz-Aul'akiy light-structure (*see* page 300); thence, a vessel  
 5 should proceed northward to the light-and-whistle-buoy, fitted with a radar reflector, moored 4½ miles eastward of the same light-structure: from thence, vessels should continue northward and, when on the alignment of the Pavlovskiy leading lights (*see* below), they should proceed to the pilot station light-and-siren buoy, No. 21, referred to above, where they  
 10 should anchor and await the pilot. *See* page 304.

- At night, having rounded Mys 'Takil' at a distance of about 3½ miles, vessels will be in the *white* sector of Nizhnyy Burunskiy light, and should steer for it or for No. 21 light-and-siren marking the entrance to Kerch'-Yenikal'skiy kanal, until Pavlovskiy leading lights are in line. Thence  
 15 they should pass through the various reaches as by day, with the various leading lights in line.

- KERCH'-YENIKAL'SKIY KANAL.—General remarks.—Buoyage.**—Kerch'-Yenikal'skiy kanal consists of four reaches, named Pavlovskoye, Burunskoye, Yenikal'skoye and Chushkinskoye, respectively,  
 20 from south to north. In 1967, the channel was dredged to a depth of 27 feet (8m2) at ordinary water level, *see* Range of water level, page 299, and Depth signals, page 21. It has a width of 350 feet (106m7) at the bottom in the various reaches and of 656 feet (200m0) at the junctions of the reaches.

- 25 The channel is marked by pairs of spar buoys, numbered consecutively from the southern entrance, and by light-buoys, in accordance with the system described on pages 22-24, namely:—Those buoys on the port hand, proceeding from the Black sea to the Sea of Azov, are red or red and white spar buoys, surmounted by black cones, point down, and red or  
 30 red and white light-buoys exhibiting *red flashing* lights; those on the starboard hand are black or black and white spar buoys, surmounted by black cones, point up, and black or black and white light-buoys exhibiting *white flashing* lights.

- In winter, after the close of navigation, the spar buoys are replaced  
 35 by cigar-shaped spar buoys of similar colour, without topmarks. With the first passage of ice through the strait the paint gets rubbed off these buoys, making their colour difficult to distinguish.

- Pavlovskoye koleno and Burunskoye koleno.—Navigational aids.**  
 —Pavlovskoye koleno commences about 2 miles south-eastward of Mys  
 40 Kamysh-Burnu (45° 14' N., 36° 25' E.) and trends northward for about 3½ miles. The eastern side of the southern entrance to this reach is marked by No. 21 light-and-siren buoy, described on page 304.

- Leading light-structures have been established for Pavlovskoye koleno. Nizhnyy Pavlovskiy, the lower light, is exhibited, at an elevation of  
 45 224 feet (68m3), from a truncated, pyramidal structure, carrying a white shield with a black, vertical stripe, 56 feet (17m1) in height, situated about 1½ miles westward of Mys Pavlovskiy. Verkhnyy Pavlovskiy, the upper light, is exhibited, at an elevation of 336 feet (102m4), from a structure similar to that of the lower light, 40 feet (12m2) in height, situated about  
 50 3½ cables northward of the lower light.

- These lights in line, bearing 356½°, lead through Pavlovskoye koleno. Owing to the short distance between the light-structures and the great difference in their elevation, this leading line is not sensitive and care should be taken when using it.

- 55 A metal framework tower 194 feet (59m1) in height, from which four

**Chart 2216.**

*red fixed* lights, disposed vertically, of no navigational significance are exhibited, stands about 11 cables westward of Verkhniy Pavlovskiy light-structure.

A red conical light-buoy with a white band, exhibiting a *red flashing* light, which lies one cable northward of No. 18 channel light-buoy, is moored on the western side of the dredged channel near the junction of Pavlovskoye koleno with Burunskoye koleno: it also marks the turn into the dredged channel leading to Kamysh-Burunskiy port, *see* below.

Two red conical buoys, each fitted with a radar reflector, are moored  $1\frac{1}{2}$  miles east-north-eastward and east-south-eastward, respectively, of No. 18 channel light-buoy; the buoys are of no navigational significance.

Burunskoye koleno trends north-eastward for about 2 miles and terminates off Mys Pavlovskiy.

Leading light-beacons have been established for Burunskoye koleno. Nizhniy Burunskiy the lower light, is exhibited, at an elevation of 90 feet (27m4), from a black beacon with a white square daymark, 39 feet (11m9) in height, situated about 4 cables westward of Mys Kamysh-Burnu. Verkhniy Burunskiy, the upper light, is exhibited, at an elevation of 161 feet (49m1), from a white shield, 30 feet (9m1) in height, situated about 7 cables south-westward of the lower light. These light-beacons in line astern, bearing about  $217\frac{1}{2}^{\circ}$ , lead through Burunskoye koleno.

No. 17 conical light-buoy, the lower part painted white and the upper part black, fitted with a radar reflector and exhibiting a *white flashing* light showing a *short flash every one-and-a-half seconds*, is moored on the south-eastern side of the dredged channel, 3 cables north-eastward of the south-western entrance to Burunskoye koleno.

A red conical buoy, fitted with a radar reflector, is moored one mile north-westward of No. 17 channel light-buoy; a red conical buoy is moored about  $1\frac{1}{2}$  cables south-eastward of the channel, one mile north-eastward of No. 17 light-buoy. These buoys are of no navigational significance.

Two rectangular framework beacons, painted black with a white, vertical, central stripe, are situated respectively, about  $1\frac{1}{2}$  cables north-eastward, and 4 cables northward of Mys Pavlovskiy, and, when in line, bearing about  $356^{\circ}$ , mark the junction between Burunskoye koleno and Yenikal'skoye koleno.

For Yenikal'skoye koleno and Chushkinskoye koleno, together with their leading lights and buoyage, *see* pages 311 and 312.

For directions through Kerch'-Yenikal'skiy kanal; *see* page 313.

**KAMYSH-BURUNSKIY PORT.—Dredged channel.—Navigational aids.**—Kamysh-Burunskiy port ( $45^{\circ} 16' N., 36^{\circ} 25' E.$ ) had not been completed in 1966. A channel, about one mile long and 266 feet (81m1) wide, leads westward from the junction of Pavlovskoye koleno and Burunskoye koleno of Kerch'-Yenikal'skiy kanal to the entrance of a basin about 6 cables in length in a west-south-westerly and east-north-easterly direction, and about 2 cables wide at its entrance, narrowing to about half a cable at its inshore end. Both the channel and basin are marked by spar buoys and were dredged, in 1958, to a depth of  $20\frac{1}{2}$  feet (6m2). The northern side of the entrance to this channel is marked by a black conical light-buoy exhibiting a *white flashing* light; farther in, a red conical light-buoy exhibiting a *blue flashing* light, and a red and white conical light-buoy exhibiting a *red flashing* light, mark the northern and southern sides, respectively, of the channel near the entrance to the basin.

*Chart 2216.*

Leading lights are exhibited, by request only, from two beacons which when in line, bearing 276°, lead through the dredged channel to the basin entrance. The front light is exhibited, at an elevation of 46 feet (14m0), from a white rectangular, slatted shield, surmounted by a diamond with a black stripe, 41 feet (12m5) in height, situated about three-quarters of a mile west-north-westward of the southern entrance point of Kamysh-Burunskaya bukhta. The rear light is exhibited, at an elevation of 59 feet (18m0) from a similar structure, 46 feet (14m0) in height, situated about a quarter of a mile westward of the front light.

Leading lights, which when in line, bearing 252°, lead into the basin, are exhibited from two beacons situated on the south-western side of Kamysh-Burunskaya bukhta. The front light is exhibited, at an elevation of 28 feet (8m5), from a white, triangular, pyramidal structure, surmounted by a rectangular shield and disc with a black stripe, 31 feet (9m4) in height; the rear light is exhibited, at an elevation of 38 feet (11m6) from a similar structure, surmounted by a rectangular shield and diamond with a black stripe, 39 feet (11m9) in height.

**Life-saving.**—There is a life-saving station, equipped with a lifeboat and line-throwing apparatus, on the coast about one mile west-south-westward of Mys Pavlovskiy.

**Storm signals.**—Storm signals, *see* page 18, are displayed from a mast near the life-saving station.

**NORTHERN PART OF KERCHENSKIY PROLIV.—Obstruction.**

—Kerchenskaya bukhta is entered on the north-western side of the strait between Mys Belyy and Mys Zmeinyy (45° 21' N., 36° 33' E.) about 2½ miles north-eastward. Kerchenskaya bukhta is described on page 314. Tamanskiy zaliv, an extensive bay on the eastern side of the strait, entered between the north-western extremity of Kosa Tuzla and the south-western extremity of Kosa Chushka, about 5 miles eastward, is described on page 317.

Numerous submerged obstructions, the positions of which may best be seen on the chart, exist in the northern part of the strait.

**Yuzhnyy Peregruzochnyy reyd.—Danger.—Buoy.—Caution.**—Yuzhnyy Peregruzochnyy reyd or South Transhipment road is that area, indicated by pecked lines on the chart, lying about one mile south-eastward of Mys Belyy and close southward of the western end of Yenikal'skoye koleno.

A 17-foot (5m2) patch, marked by a spar buoy surmounted by a cross, lies near the centre of this road. A 17-foot (5m2) shoal, situated close northward of the north-eastern corner of the road, is described on page 311.

Vessels approaching this road should on no account pass southward or eastward of Tuzlinskiy light-buoy No. 15 as it is moored close north-westward of the submerged stone barrier mentioned on page 305.

*Charts 2216, 2233.***Mys Zmeinyy to Mys Fonar'.—Dangers.—Navigational aids.**

From Mys Zmeinyy the north-western side of the strait trends eastward for about 2½ miles to Mys Yenikale which is rocky and sloping, and steep to off its eastern side. The village of Kapkany with extensive gardens, lies about midway along this stretch of coast. The village of Senyagino (Yenikale) stands on the slopes within Mys Yenikale, and on a ridge close northward of the cape are the walls of an ancient fortress.

A rocky reef, with depths of 4 feet (1m2) over it, extends about a quarter of a mile offshore about 3 cables eastward of Mys Zmeinyy;

*Charts 2216, 2233.*

its south-western side is marked by a black spar buoy surmounted by a cone, point up.

Yenikal'skaya otmel', an extensive flat composed of sand and shells, on which lie Tserkovnyye banki, with depths of from 4 to 6 feet (1m2 to 1m8), extends offshore between Mys Yenikale and a position about one mile westward of it as far as Yenikal'skoye koleno of the dredged channel, about three-quarters of a mile southward. 5

The light-buoy marking the south-eastern edge of this flat also marks the northern side of Yenikal'skoye koleno of the dredged channel, and is described on page 312. A white, conical buoy, moored about 6 cables east-south-eastward of Mys Yenikale, marks the eastern edge of this flat. 10

From Mys Yenikale ( $45^{\circ} 21' N.$ ,  $36^{\circ} 36' E.$ ) the coast trends north-eastward for about 3 miles to Mys Fonar'. A wide valley, descending from the lower slopes of Gora Khroni (page 297), opens out between these two capes in a sandy plain forming a broad, rounded point. A fish cannery with three small piers on the coast about one mile north-eastward of Mys Yenikale. 15

A basin, protected by two breakwaters, containing the north-western terminal of the Railway Ferry Crossing, referred to on page 312, is situated  $1\frac{1}{2}$  miles north-eastward of Mys Yenikale; lights are exhibited from the heads of each breakwater. 20

Mys Fonar' is a steep and rocky point which rises to a hill about 4 cables west-north-westward. The southern side of this cape rises from the plain in a steep, white bluff. The hill within the cape is separated from Gora Khroni by a valley, and from a distance, appears as an island. 25

Yenikal'skiy light is exhibited, at an elevation of 390 feet (118m9), from a wooden framework tower, 66 feet (20m1) in height, situated on the summit of the hill about 4 cables west-north-westward of Mys Fonar'. A radiobeacon transmits from the lighthouse. 30

Two lights, of no navigational significance, are exhibited about one mile north-westward of Mys Fonar'. The front and rear lights are exhibited from black rectangular daymarks each with a yellow central stripe, about 35 feet (10m7) in height, at elevations of 59 and 98 feet (18m0 and 29m9), respectively; in line, they bear  $252\frac{1}{4}^{\circ}$ . 35

A small, rocky patch with a least depth of 18 feet (5m5), lies about one mile south-south-eastward of Mys Fonar'; a spar buoy, painted red and white with a ball surmounted by a cross as topmark, is moored on this patch.

**Life-saving.**—A life-saving station, equipped with a lifeboat, and consisting of a number of white, stone buildings, is situated at Mys Yenikale ( $45^{\circ} 21' N.$ ,  $36^{\circ} 36' E.$ ). 40

**Kosa Chushka to Mys Kamenny.**—**Dangers.**—**Navigational aids.**—From a position about 5 miles eastward of the north-western extremity of Kosa Tuzla, described on page 304, to a position about 9 miles farther north-eastward where it joins the mainland, the south-eastern side of the strait is formed by Kosa Chushka, which is low and sandy. Thence the coast rises gradually for about 2 miles farther north-eastward to Mys Akhilleon ( $45^{\circ} 26' N.$ ,  $36^{\circ} 47' E.$ ), a bluff headland. 45

A light is exhibited, at an elevation of 164 feet (50m0), from a white, triangular, framework structure with a rectangular topmark, 20 feet (6m1) in height, with a dwelling adjoining it, situated on Mys Akhilleon. A fog signal is sounded and a radiobeacon transmits from the lighthouse. 50

Leading light-structures for Chushkinskoye koleno which are situated near the south-western extremity of Kosa Chushka, are described on page 312, and leading light-structures for Yenikal'skoye koleno, which 55



**Charts 2216, 2233.**

are situated south-westward and south-south-eastward, respectively, of Mys Akhilleon, are described on page 311.

Mys Kamennyy, about 3 miles eastward of Mys Akhilleon, is bluff and rises to a low hill on which there are several farms and a few scattered trees. See view [30]. For coast eastward, see page 335.

Mys Akhilleon and Mys Kamennyy and the stretch of coast between them are fronted by submerged rocks and should not be approached within a distance of one mile where there are depths of 30 feet (9m1). The western part of this rocky area is covered by the red sector of Yenikal'skiy light between the bearings of 234° and 309°.

The south-western extremity of Kosa Chushka is fringed by an extensive flat which, with depths of less than 12 feet (3m7) near its edge, extends about 3 miles west-south-westward and 2½ miles north-westward into the strait, and closely approaches Yenikal'skoye koleno of the dredged channel.

Khersonskaya banka, which was at one time a separate shoal, is now a continuation of this extensive flat, and extends about 2½ miles northward from the extremity of Kosa Chushka to the dredged channel, which has been cut through its northern part. There are depths of from 8 to 12 feet (2m4 to 3m7) near its northern end. No. 7 light-buoy marking the south-eastern edge of the dredged channel where it cuts through Khersonskaya banka, is described with Yenikal'skoye koleno on page 312.

Numerous dolphins stand in an area which extends south-eastward across the strait from Mys Yenikale to Kosa Chushka.

**Chart 2233.**

**Mys Fonar' to Mys Khroni.—Buoyage.**—From Mys Fonar' the western side of the strait trends north-westward for about 3 miles to Mys Varzovka. This stretch of coast is low at first but it then rises in precipitous white cliffs to Mys Varzovka, a high bluff which projects north-eastward from the general line of the coast.

The buoyage lying about 1½ miles north-eastward of Mys Fonar' is described on page 312.

*Varzovski* conical light-and-whistle buoy painted black and white in bands, fitted with a radar reflector and exhibiting a *white flashing* light every five seconds, is moored about 4 miles north-eastward of Mys Varzovka.

From Mys Varzovka the coast continues in a north-westerly direction for about 1½ miles and terminates in Mys Khroni, the western entrance point of the northern entrance to the strait. This stretch of coast is a steep slope, 315 feet (96m0) high, covered with vegetation with white patches. Mys Khroni is high, rounded and sloping, and on its eastern side are the white buildings of a farm surrounded by a garden.

**Prohibited anchorage.—Spoil ground.—Obstruction.**—Anchorage is prohibited on account of submarine cables in an area, indicated on the chart, which extends eastward across the northern part of the strait from Mys Fonar' and Mys Varzovka to the northern part of Kosa Chushka. A spoil ground lies close northward of the north-eastern end of this area and is marked on its western side by a spar buoy surmounted by two cones, bases together; an obstruction lies on the eastern side of the spoil ground, 2½ miles south-westward of Mys Akhilleon light-structure (page 309).

**Prohibited area.**—Navigation is prohibited within an area, the limits of which are indicated by pecked lines on the chart, south-eastward and westward of Mys Yenikale. See also page 300.

*Charts 2216, 2233.*

**KERCH'-YENIKAL'SKIY KANAL** (*continued from page 307*).—**Yenikal'skoye koleno**.—**Leading lights**.—**Buoyage**.—**Beacons**.—Yenikal'skoye koleno trends in an east-north-easterly direction from southward of Mys Pavlovskiy ( $45^{\circ} 18' N.$ ,  $36^{\circ} 29' E.$ ) for about 8 miles. This reach has been dredged through the southern edge of Yenikal'skaya otmel' and the northern edge of Khersonskaya banka. 5

Leading lights for Yenikal'skoye koleno, known as Kamysh-Burunskiy-Churubashskiy leading lights, have been established on the south-western side, and reciprocal leading lights, known as Akhilleonskiy leading lights, have been established on the north-eastern side of the strait. 10

Kamysh-Burunskiy light, the front light of the Kamysh-Burunskiy-Churubashskiy leading line, is exhibited at an elevation of 105 feet (32m0), from a white, rectangular, stone tower and dwelling, 22 feet (6m7) in height, situated amongst some trees on the edge of a yellow cliff, about  $2\frac{1}{2}$  miles northward of Mys Kamysh-Burnu. This light-structure may be distinguished by its peculiar shape from the numerous white houses in the vicinity. 15

Churubashskiy light, the rear light, is exhibited, at an elevation of 347 feet (105m8), from a white, rectangular, stone tower and dwelling, 23 feet (7m0) in height, situated about 5 miles west-south-westward of the front light. These lights in line astern, bearing  $247^{\circ}$ , lead through Yenikal'skoye koleno. Though standing on the skyline, this lighthouse owing to its small size, is not easily distinguished from a distance of more than 7 miles; at greater distances it appears as a jagged tooth. At night, the light is difficult to distinguish from the lights of the buildings at Kamysh-Burnu and it is liable to be obscured by exhalations from Ozero Churubashskoye. Owing to the distance apart of the lights, this leading line is extremely sensitive. 20 25 30

Auxiliary lights are exhibited during poor visibility by day from Kamysh-Burunskiy and Churubashskiy leading light-structures.

Nizhnyy Tamanskiy, the front light of the Akhilleonskiy leading line is exhibited, at an elevation of 29 feet (8m8), from a red shield with a square topmark, 26 feet (7m9) in height, situated on Kosa Chushka about 6 miles from its south-western extremity; Verkhnyy Tamanskiy, the rear light is exhibited, at an elevation of 64 feet (19m5), from a three-sided, pyramidal structure with a cross topmark, 20 feet (6m1) in height, situated about  $3\frac{1}{2}$  miles east-north-eastward of the front light. These lights in line, bearing  $067^{\circ}$ , also lead through Yenikal'skoye koleno. 35 40

Tuzlinskiy light-buoy No. 15 marking the extremity of the flat extending north-westward from Kosa Tuzla, is described on page 305.

Ak-Burunskiy light-buoy, No. 14, painted red with a white band and exhibiting a *red flashing* light *every one-and-a-half seconds*, is moored on the northern side of the dredged channel off the eastern extremity of Ak-Burunskiy rif, and about one mile eastward of Mys Belyy. This light-buoy also marks the western side of the entrance to the dredged channel leading to Kerchenskaya bukhta. This position is also marked by a black conical light-buoy, exhibiting a *white flashing* light *every three seconds*, moored on the south-eastern side of the fairway, and is further indicated by the alignment of Tuzla Taman' leading lights (page 317) situated near the north-western extremity of Tamanskiy poluostrov, about 2 miles north-eastward of Mys Tuzla (page 303), which in line bear  $138\frac{1}{2}^{\circ}$ . 45 50

A 17-foot (5m2) shoal, situated on the southern side of the dredged channel about  $1\frac{1}{2}$  miles eastward of Mys Belyy is marked by a white 55

*Charts 2216, 2233.*

conical buoy moored on its northern side, 2 cables eastward of No. 14 light-buoy.

- 5 A light-buoy, painted red and exhibiting a *red flashing* light showing a *short flash every three seconds*, is moored on the northern side of the dredged channel about three-quarters of a mile south-westward of Mys Yenikale ( $45^{\circ} 21' N.$ ,  $36^{\circ} 36' E.$ ), and marks the south-eastern side of Yenikal'skaya otmel', described on page 309.

- 10 No. 7 black conical light-buoy, exhibiting a *white flashing* light every *three seconds*, is moored on the southern side of the dredged channel, about 9 cables east-south-eastward of Mys Yenikale, and marks the north-eastern side of Khersonskaya banka, described on page 310.

- 15 The eastern end of Yenikal'skoye koleno at its junction with Chushkinskoye koleno is marked on its northern side by No. 6 light-buoy, painted red with a white band and exhibiting a *red flashing* light every *one-and-a-half seconds*, and on its southern side by No. 5 light-buoy, painted black with a white band, fitted with a radar reflector and exhibiting a *white flashing* light every *one-and-a-half seconds*.

- 20 Two beacons, situated, respectively, about one cable, and 3 cables south-south-eastward of Yenikal'skiy light, in line and bearing  $344^{\circ}$ , mark the commencement of the turn from Yenikal'skoye koleno into Chushkinskoye koleno; two further beacons, situated respectively, about  $1\frac{1}{2}$  miles north-north-eastward, and  $1\frac{1}{2}$  miles north-eastward of Mys Yenikale, in line and bearing about  $283^{\circ}$  mark the end of this turn.

- 25 **Chushkinskoye koleno. — Navigational aids. —** Chushkinskoye koleno leads in a north-north-easterly direction to the northern entrance to the strait. The channel, for a distance of about 9 cables from its southern end, is marked by spar buoys, whence it leads into greater depths. Near the southern end of this channel its eastern side is marked  
30 by No. 3 light-buoy, painted black with a white band and exhibiting a *white flashing* light every *one-and-a-half seconds*, moored near the  $283^{\circ}$  alignment referred to above; thence, about  $2\frac{1}{2}$  miles north-north-eastward, the fairway passes between two light-buoys moored about  $1\frac{1}{2}$  miles north-eastward of Yenikal'skiy light-structure. The eastern of these  
35 light-buoys is painted black with the number "1" in white, and exhibits a *white flashing* light every *three seconds*; the western light-buoy is painted red with the number "2" in white, and exhibits a *red flashing* light every *three seconds*. A conical light-buoy, painted in black and white stripes and exhibiting a *white flashing* light, is moored about one cable southward of  
40 No. 1 light-buoy.

- Leading lights have been established for Chushkinskoye koleno. Peredny Chushkinskiy, the front light, is exhibited at an elevation of 34 feet ( $10m4$ ), from a cylinder on a metal framework structure, situated about one mile north-north-eastward of the south-western extremity of  
45 Kosa Chushka; Zadniy Chushkinskiy (Dalni Chushka), the rear light, is exhibited, at an elevation of 54 feet ( $16m5$ ), from a similar structure, situated about 6 cables south-south-westward of the front light-structure.

- Railway ferry crossing. — Lights. — Regulations. — Prohibited anchorage. —** An area, known as the Railway Ferry Crossing Zone, in which fishing and anchorage are prohibited, lies with its centre about the position of Nos. 5 and 6 light-buoys (*see* above) moored at the junction of Chushkinskoye koleno and Yenikal'skoye koleno, just over 2 miles east-north-eastward of Mys Yenikale. The area, which is about one  
55 mile wide, extends in a west-north-westerly/east-south-easterly direction from its centre to near the shore on either side of the strait; the ferry

*Charts 2216, 2233.*

fairway follows the same direction and passes across the buoyage marking the junction of the two reaches.

A pair of *blue fixed* lights, in line, situated nearly  $1\frac{1}{2}$  miles north-eastward of Mys Yenikale, indicate the northern part of the ferry fairway; a similar pair of lights in line, situated on the opposite shore, about 3 miles east-south-eastward of Mys Yenikale, indicate the southern part of the ferry fairway.

The ferry exhibits two all-round *green* lights, vertically disposed.

All vessels within the ferry crossing zone are permitted to move only in the navigable channel and vessels with a draught of more than 13 feet (4m0), while in the zone, must display from the foremast a black ball by day or a *red* light at night. Speed of vessels in the ferry crossing zone should be as slow as possible, and must not exceed 6 knots. The ferry gives way to vessels of more than 13-foot (4m0) draught, except when fog signals are being sounded when it gives way to all other vessels.

**KERCH'-YENIKAL'SKIY KANAL.—Directions.**—Vessels proceeding from the Black sea to the Sea of Azov, having arrived off No. 21 light-and-siren buoy (page 304) as directed on page 305 should keep Pavlovskiy light-structure (page 306) in line, bearing  $356\frac{1}{2}^{\circ}$ , leading through Pavlovskoye koleno, until Burunskiye light-structures (page 307) are coming into line. Course should then be altered to bring Burunskiye light-structures into line, astern, bearing  $217\frac{1}{4}^{\circ}$ , which leads through Burunskoye koleno. The tallest and northernmost of a group of chimneys of the Metallurgic works on the north-eastern side of Kerchenskaya bukhta, *see* page 313, makes a useful mark on which to steady when turning into Burunskoye koleno.

When the beacons near Mys Pavlovskiy, described on page 306, come into line bearing about  $356^{\circ}$ , course should be altered to bring Kamysh-Burunskiy light-tower and Churubashskiy light-tower into line astern, bearing  $247^{\circ}$ , passing between Tuzlinskiy light-buoys, Nos. 15 and 16, marking the north-western extremity of the sunken stone barrier off the flat extending from Kosa Tuzla, taking care not to turn short. This will lead between the buoys marking Yenikal'skoye koleno.

Should Kamysh-Burunskiy light-tower ( $45^{\circ} 17' N., 36^{\circ} 25' E.$ ) be difficult to make out, as is often the case in bad weather, the conical formation of trees northward of it should be kept in line with the northern side of the clump of trees surrounding Churubashskiy light-tower; these marks, or Akhilleonskiye light-structures, described on page 311, in line ahead, bearing  $067^{\circ}$ , will lead in mid-channel from abreast Mys Zmeinyy north-eastward through Yenikal'skoye koleno. When eastward of the meridian passing through Yenikal'skiy lighthouse, great care is necessary to avoid being set southward of the centre line of the channel. When Chushkinskiye light-structures, described on page 312, are coming into line, course should be altered to bring and keep them in line astern, bearing  $194\frac{1}{4}^{\circ}$ , being guided by the beacons marking the commencement and end of this turn, described on page 312; this leads between the buoys marking Chushkinskoye reach to Varzovskiy light-and-whistle buoy (page 310) and thence into the Sea of Azov.

Vessels proceeding from the Sea of Azov to the Black sea, having entered the dredged channel on the line of Chushkinskiye leading lights, should reduce speed in plenty of time to keep control of the ship, as the turn into Yenikal'skoye koleno is a large one, and the current, if any, will probably be setting across the channel. When turning, the leading line of Churubashskiy and Kamysh-Burunskiy leading lights should

*Charts 2216, 2233.*

- on no account be overshoot, the depths being slightly greater on the northern side if a bad turn is made. When turning into Burunskoye koleno care should be taken to avoid turning short. Verkhnyy Burunskiy lighthouse is not always easy to identify and it is therefore advisable to be prepared with some other mark; the beacons near Mys Pavlovskiy, described on page 306, will assist in making this turn.

Vessels should take care to allow for the currents, *see* page 298, when altering course at the bends in the dredged channel.

- Directions for approaching the strait from the Sea of Azov are given on page 342.

*Chart 2216.*

- KERCHENSKAYA BUKHTA.—Aspect.**—Kerchenskaya bukhta is entered on the north-western side of the strait between Mys Belyy ( $45^{\circ} 19' N.$ ,  $36^{\circ} 30' E.$ ) and Mys Zmeinyy, about  $2\frac{1}{2}$  miles north-eastward. The nature of the bottom in this bay is soft mud and vessels will not be damaged by grounding on it.

- Ak-Burunskiy rif, which fringes Mys Belyy, is described on page 304. From Mys Belyy the southern side of Kerchenskaya bukhta trends westward for about half a mile and thence curves northward for about  $1\frac{1}{2}$  miles to the town of Kerch', which is situated at the head of the bay with Kerchenskiy port fronting it. The first half mile of this stretch of coast is steep, and, in places, precipitous; thence, as far as the town of Kerch', the western side of the bay is low and sandy.

- A small landing jetty, protected by Zashchitnogo mole, is situated about 2 cables westward of Mys Belyy.

A light is exhibited at an elevation of 20 feet (6m1) from a red quadrangular truncated metal framework structure, 14 feet (4m3) in height, situated on the head of Zashchitnogo mole.

- Farther northward there are several piers, the southernmost of which can accommodate small craft of up to 7 feet (2m1) in draught.

- Neftyanaya pristan', the Petroleum pier, which is T-shaped, is situated about  $1\frac{1}{2}$  miles north-westward of Mys Belyy; its head is 50 feet (15m2) long and has depths of 16 feet (4m9) alongside. A basin off this pier and a dredged channel leading to it are described on page 315.

Between Neftyanaya pristan' and Kerchenskiy port there is a small shipyard and wharf.

- Gora Mitridat, with a chain of hills extending westward from it, rises on the south-western side of the town of Kerch' about  $2\frac{1}{2}$  miles north-westward of Mys Belyy; a war memorial stands on the summit of Gora Mitridat. Reka Dzharzhava, a small stream, flows into the bay about half a mile southward of Neftyanaya pristan'.

- Kerchenskiy port is situated at the north-western corner of the bay between Genuzskiy mol, about 2 miles north-north-westward of Mys Belyy, and Shiraskiy mol, about half a mile farther northward.

Between Shirokiy mol and Mys Karantinnyy, a high, rocky point about  $1\frac{1}{2}$  miles east-south-eastward, the northern side of the bay is low and of clay formation. This stretch of coast is fronted by a flat with depths of less than 6 feet (1m8) which extends as much as 2 cables offshore.

- Mys Zmeinyy ( $45^{\circ} 21' N.$ ,  $36^{\circ} 33' E.$ ), about  $1\frac{1}{2}$  miles east-south-eastward of Mys Karantinnyy, is small and cliffy and may easily be identified by a large, detached rock lying close off it.

- A mole, belonging to the Government metallurgic works, is situated about 4 cables westward of Mys Zmeinyy. A basin off this mole and a dredged channel leading to it are described on page 315.

*Chart 2216.*

Mys Karantinny is a good landmark and so also is the Metallurgic works. The latter, with several tall chimneys, is situated about three-quarters of a mile northward of Mys Zmeinny. At night, the glow from the blast furnaces of this works is visible from a considerable distance. 5

**Spoil ground.**—A spoil ground about three-quarters of a mile in extent has its centre about 4 cables south-westward of Mys Karantinny.

**Dredged channels.**—**Navigational aids.**—Kerchenskiy approach channel branches off Yenikal'skoye koleno about one mile eastward of Mys Belyy and leads to a basin about 3 cables long and the same distance 10 wide, off Shiroskiy mol; the channel is 266 feet (81m1) wide and had, in 1966, a depth of 20½ feet (6m2) available to vessels of draught 17 feet (5m2).

Leading lights have been established for Kerchenskiy approach channel, and it is marked by light-buoys and spar buoys. 15

Three leading lights lead through the channel to Shiroskiy mol. The front light is exhibited, at an elevation of 30 feet (9m1), from a red, rectangular shield with a white, vertical stripe, 26 feet (7m9) in height, situated on the south-western corner of Shiroskiy mol; the centre light is exhibited, at an elevation of 47 feet (14m3), from an iron, framework 20 tower, surmounted by a slatted framework, painted in black and white horizontal bands, 43 feet (13m1) in height; situated near the root of Shiroskiy mol; the rear light is exhibited, at an elevation of 88 feet (26m8), from a metal pyramid surmounted by two white rectangular daymarks, 13 feet (4m0) in height, situated on the hillside about 8 cables north- 25 north-westward of the centre light. These lights in line, bearing 330½°, lead through the centre of Kerchenskiy approach channel.

Ak Burunskiy light-buoy No. 14, marking the western side of the entrance to this channel, is described on page 311.

A light-buoy, painted red and white and exhibiting a *green flashing* light 30 showing a *short flash every two seconds*, is moored on the western side of the channel about one mile northward of Mys Belyy, and marks the turn from this channel into the channel leading to Neftyanaya pristan'.

A black conical light-buoy, exhibiting a *white quick flashing* light, is moored on the eastern side of the dredged channel near the entrance 35 to the basin off Shiroskiy mol, 2 cables east-south-eastward of the head of Genuezskiy mol (45° 21' N., 36° 29' E.); an obstruction lies three-quarters of a cable south-eastward of this position.

A channel 262 feet (79m9) wide has been dredged from Kerchenskiy approach channel in a westerly direction to Neftyanaya pristan', off 40 which it widens into a basin about 2½ cables wide in a northerly and southerly direction. Both the channel and basin are marked by spar buoys and had depths, in 1938, of 15 feet (4m6).

Leading lights are occasionally exhibited, the front at an elevation of 27 feet (8m2) and the rear, 50 feet (12m2), from two white rectangular 45 shields, each with a black vertical stripe and surmounted by a triangle, that on the front structure being inverted, 29 and 26 feet (8m8 and 7m9), respectively, in height, situated about 5 cables apart, westward of Neftyanaya pristan'. These lights in line, bearing 272°, lead through the channel to the pier. 50

A channel, marked by spar buoys, with a width of 196 feet (59m7) and a depth in 1938, of 15 feet (4m7), has been dredged from the junction of Yenikal'skoye koleno and Kerchenskiy approach channel to the Metallurgic works mole, near which it widens to a basin about 2 cables 55 long and 1½ cables wide.

The junction of the dredged channels is marked by a conical light-

*Chart 2216.*

buoy, painted in black and red stripes with a black and red superstructure, exhibiting a *white flashing light every six seconds*.

- Leading lights are exhibited, the front at an elevation of 82 feet (25m0) and the rear, 104 feet (31m7), from two iron framework towers, 49 and 16 feet (14m9 and 4m9), respectively, in height, situated north-north-eastward of the Metallurgic works mole. The upper part of the front tower is sheathed, and the rear tower has a daymark consisting of a square and triangle. There lights in line, bearing 023°, lead through the channel to the Metallurgic works mole; they are exhibited only by request to the Harbour master at Kerch'.

Lights are exhibited at the eastern and western corners of the head of the mole. A fog signal is sounded from the head of the mole.

- Anchorage.**—Anchorage can be obtained in Kerchenskiy reydy, in the western part of Kerchenskaya bukhta, by vessels drawing not more than 13 feet (4m0).

- Kerchenskiy port.**—**Light.**—**Depths.**—Kerchenskiy port is formed between Genuezskiy mol and Shiroskiy mol, between which are several quays and piers. Genuezskiy mol extends about  $1\frac{3}{4}$  cables eastward from the shore and thence northward for about 2 cables. Shiroskiy mol is about 800 feet (243m8) long and its head is about 420 feet (128m0) wide.

A light is exhibited, at an elevation of 37 feet (11m3), from a red, framework tower, 29 feet (8m8) in height, situated on the head of Genuezskiy mol ( $45^{\circ} 21' N.$ ,  $36^{\circ} 29' E.$ ).

- In 1938, there were depths of 14 feet (4m3) alongside Genuezskiy mol and in the southern part of the harbour; the latter is used by small craft and coasting vessels. The northern part of the harbour had depths of 22 feet (6m7) and is used by passenger and cargo vessels. Alongside the south-western side of Shiroskiy mol there were depths, in 1938, of 15 feet (4m6), shoaling to 8 feet (2m4) alongside its inner end; alongside its head and north-eastern sides there were depths of 15 feet (4m6).

- North-eastward of Shiroskiy mol there are another smaller mole and several quays, alongside which, and in the basin thus formed there were depths, in 1938, of 8 feet (2m4). This basin affords shelter to small craft in bad weather.

**Kerch'.**—The city of Kerch' ( $45^{\circ} 21' N.$ ,  $36^{\circ} 28' E.$ ), with a population, in 1967, of 115,000 is, owing to the development of its local natural resources of iron ore and oil, the industrial centre of the Crimea. It is the seat of local government.

- The local industries also include engineering, fruit and fish canning, stone-quarrying, etc.

The harbour is the transshipping point for trade between U.S.S.R. ports in the Black sea and Sea of Azov.

- Pilots.**—Kerch' is the headquarters of the Eastern Black Sea Pilotage district. See also pages 14 and 299–300.

**Port facilities.**—Repairs to hull and machinery can be effected. There is a patent slip. A floating crane and several tugs are available. Coal can be obtained in limited quantities; ample notice should be given to the Harbour master.

- Fresh provisions are plentiful. Fresh water is laid on to the quays and piers.

**Depth signals.**—**Storm signals.**—Depth signals, see page 21, are displayed from a mast on Gora Khroni.

- Storm signals, see page 18, are displayed from a mast on Genuezskiy mol.

**Chart 2216.**

**Life-saving.**—There is a life-saving station, equipped with a specially-equipped lifeboat and line-throwing apparatus, in Kerchenskiy port.

**Communications.—Radio station.**—The harbour is connected to the general railway system. During the season of navigation there is regular sea communication with ports in the Black sea and Sea of Azov. 5

There is a radio station at Kerch'; see page 26.

**Climatic table.**—See page 79.

**TAMANSKIY ZALIV.—Aspect.**—Tamanskiy zaliv is entered between the north-western extremity of Kosa Tuzla and the south-western extremity of Kosa Chushka, about 5 miles eastward, but the entrance is much obstructed by shallow flats which extend from each entrance point. The bay is divided into two parts by spits which extend towards each other from Kosa Markitanskaya, a low point on the southern shore about 7½ miles east-north-eastward of Mys Tuzla, and from Kosa Rubanova, a point on the opposite shore about 3½ miles farther north-north-eastward, leaving a narrow channel between them. 10 15

Gora Lysaya ( $45^{\circ} 13' N.$ ,  $36^{\circ} 41' E.$ ) rises from the southern shore of the bay to an elevation of 216 feet (65m8), about 3½ miles east-north-eastward of Mys Tuzla. At its foot is a blunt, rocky point with some prominent white landslides. 20

Gora Karabetova, about 4½ miles east-south-eastward of Gora Lysaya, is 488 feet (148m7) high; from it, a range, known as Tamanskiye gory, extends eastward parallel with and about 2 miles within the southern shore of the bay. 25

The southern shore of the bay is high and steep between the root of Kosa Tuzla and the blunt, rocky point at the foot of Gora Lysaya, but thence it becomes low and sloping as far as Kosa Markitanskaya, about 3½ miles farther east-north-eastward.

The town of Taman' (page 318), is situated on the southern shore of the bay about 1½ miles eastward of Gora Lysaya. The ruins of the old Fanagoriya fortress stand on the coast about one mile eastward of the town, and between them is situated a conspicuous church. 30

Kosa Markitanskaya is low and has a small salt lake lying within it. From the point, the southern shore of the bay trends east-north-eastward for about 10 miles to its head, rising in gradual slopes to Tamanskiye gory. 35

On the northern side of the bay a shallow inlet is entered between the south-western extremity of Kosa Chushka and Kosa Rubanova, about 7 miles eastward. From Kosa Rubanova the northern shore of the bay trends east-north-eastward for about 8½ miles to its head. This stretch is low, but rises, a short distance inland, to moderately high hills, of which Gora Gorelaya, described on page 297, situated about 2½ miles north-north-eastward of Kosa Rubanova, is the westernmost and Gora Ada, 374 feet (114m0) high, about 4½ miles eastward of Gora Gorelaya, is the easternmost. 40 45

**Channels.—Buoyage.**—The fairway of the entrance channel to Tamanskiy zaliv is about 5 cables wide, with a least depth of 13 feet (4m0) in the fairway, between the flats extending from Kosa Tuzla and Kosa Chushka.

Tuzla Taman' leading lights for the approach channel to Tamanskiy zaliv from Yenikal'skoye koleno are situated on the north-western end of Tamanskiy puluoostrov, about 2 miles north-eastward of Mys Tuzla; in line these lights bear  $138\frac{1}{2}^{\circ}$ . 50

The eastern side of the above approach channel is marked by a red conical light-buoy, exhibiting a *white flashing* light, moored  $1\frac{3}{4}$  miles 55



**Chart 2216.**

south-eastward of the channel entrance, nearly  $2\frac{1}{2}$  miles northward of Tuzlinsky beacon; a spar buoy surmounted by two cones, bases together, is moored close eastward of the light-buoy. The southern end of this  
 5 channel is marked by a conical light-buoy, painted red and white in stripes and exhibiting a *red flashing* light; this light-buoy marks the turning position from the above alignment for vessels proceeding to Taman' or farther eastward to the head of the bay.

A channel about one cable wide, with depths of 12 feet (3m7), leads  
 10 between the flats which extend from Kosa Markitanskaya and Kosa Rubanova. It is marked on its northern side by a light-buoy, painted red and exhibiting a *red flashing* light showing a *short flash every five seconds*; the southern side of the entrance to this channel is marked by a spar buoy surmounted by a black cone, point up.

15 A former spoil ground, the limits of which are indicated on the chart by pecked lines, lies close off the coast westward of Gora Lysaya.

**Submarine cables.—Caution.—**See page 297.

**Taman'.—Lights.—Radio station.**—The town of Taman' ( $45^{\circ} 13' N.$ ,  $36^{\circ} 43' E.$ ) is only of importance as a place of communication with the  
 20 Caucasus. The local industries are farming and fishing.

Tamanskaya pristan', with a depth of 12 feet (3m7) alongside its head, which is 100 feet (30m5) wide, projects from the shore abreast the town. A light is exhibited, at an elevation of 53 feet (16m2), from a signal tower with a mast, 16 feet (4m9) in height, situated near the root of the pier.  
 25 A large building, formerly a church, situated about  $1\frac{1}{2}$  cables westward of the pier, is a prominent mark.

Regular sea communication is maintained with Kerch'.

Leading lights have been established southward of Kosa Markitanskaya. The front light is exhibited, at an elevation of 39 feet (11m9),  
 30 from a white rectangular beacon with a black vertical stripe, 33 feet (10m1) in height, situated about 8 cables southward of Kosa Markitanskaya; the rear light is exhibited, at an elevation of 61 feet (18m6), from a similar beacon, 39 feet (11m9) in height, situated about 9 cables eastward of the front light. These light-beacons are in line bearing  $090^{\circ}$ .

35 Leading lights have been established about one mile westward of Tamanskaya pristan'. The front light is exhibited, at an elevation of 98 feet (29m9), from a white rectangular beacon with a black vertical stripe, 13 feet (4m0) in height; the rear light is exhibited at an elevation of 121 feet (36m9), from a similar beacon, 14 feet (4m3) in height. These  
 40 light-beacons are in line bearing  $225^{\circ}$ .

**Anchorage.—Shoal.**—Anchorage can be obtained, in depths of from 11 to 16 feet (3m4 to 4m9), about 3 cables off Tamanskaya pristan'.

A rock with a depth of less than 6 feet (1m8) over it lies 8 cables northward of Tamanskaya pristan'; it is marked on its eastern side by a conical  
 45 light-buoy, painted red and white in stripes, exhibiting a *red flashing* light.

**Sennaya pristan'.—Buoys.—Lights.**—In the south-eastern corner of the head of Tamanskiy zaliv, near the village of Sennaya, there is a pier, off which a small basin with an approach channel, about half a  
 50 mile long and marked by spar buoys, has been dredged in an  $083\frac{1}{2}^{\circ}$  direction. In 1946, there was a least depth of 8 feet (2m4) in the approach channel and basin, and depths of  $6\frac{1}{2}$  feet (2m0) alongside the pier.

Leading lights have been established near Sennaya pristan'. The front light is exhibited, at an elevation of 26 feet (7m9), from a beacon  
 55 consisting of a white shield with a black, vertical, central, stripe, 13 feet (4m0) in height; the rear light is exhibited at an elevation of 39 feet (11m9),

*Chart 2216.*

from a beacon consisting of a black daymark with a white stripe, 31 feet (9<sup>m</sup>4) in height. These light-beacons are in line bearing 083½°.

**Directions.**—Vessels proceeding from Kerch' to Taman' should keep Kerchenskiye approach channel leading lights (page 315), in line astern, 5 bearing 331°, until abreast the conical buoy marking the 17-foot (5<sup>m</sup>2) patch north-eastward of Yuzhnyy Peregruzochnyy reydy, when course should be altered to the alignment of Tuzla Taman' leading lights bearing 138½°. From the southern end of this alignment, at the position of the 10 turning light-buoy moored nearly 1½ miles south-eastward of the south-eastern end of Kosa Tuzla, course may be altered for Tamanskaya pristan' (45° 13' N., 36° 43' E.) or the anchorage off it.

Vessels proceeding to the eastern part of Tamanskiy zaliv should follow the above directions until near the position of the turning light-buoy, referred to above, whence course should be shaped about 090° to 15 pass between the buoys marking the channel between the flats extending from Kosa Markitanskaya and Kosa Rubanova, and thence as requisite.

## CHAPTER IX

## SEA OF AZOV

*Chart 2234.*

- SEA OF AZOV.—General remarks.**—The districts bordering on the Sea of Azov, in the Russian language Azovskoye more, are remarkable, not only for their wealth of agriculture, but also for the large mineral resources they possess in the coal and iron fields of the basins of Reka Don and Donets Mertvyi, and in the oil districts of Reka Kuban'. Owing, however, to ice, and to the fact that the shallowness of the sea prevents vessels from loading within several miles of some of the smaller ports, the trade of the Sea of Azov is much hampered.
- 10 The water has a greenish, muddy colour, and is very opaque, on account of the large amount of silt carried down by the rivers and held in suspension, and also of the great quantities of plankton in it. Towards the end of summer, the surface becomes almost completely covered with greenish-brown seaweed.
- 15 **Rivers.**—The principal rivers flowing into this sea are Reka Don and the small Reka Mius and Reka Kal'mius on the northern shore, Reka Yeya, which flows into Yeyskiy (Yeisk) liman, on the southern shore of Taganrogskiy zaliv (Gulf of Taganrog), and Chernyy Protok (Karakuban), on the eastern shore.
- 20 **Islands.**—Besides Biryuchiy (Biryuchi) ostrov ( $46^{\circ} 07' N.$ ,  $35^{\circ} 10' E.$ ) the south-western part of Fedotova kosa, the only islands in this sea are Peschanyye (Peschani) ostrova, situated about 9 miles northward of Yeysk (Yeisk) ( $46^{\circ} 42' N.$ ,  $38^{\circ} 17' E.$ ) and Cherapakha, about one mile southward of Taganrog. These islets are so low that they are sometimes
- 25 covered by the sea.
- Ports.**—On the southern shore there is the port of Temryuk ( $45^{\circ} 19' N.$ ,  $37^{\circ} 23' E.$ ), in which small vessels can shelter; there are also two anchorages which afford shelter in fresh easterly or westerly winds, one in Kazantipskiy (Kazantip) zaliv (page 322) and the other in Arabatskiy
- 30 (Arabat) zaliv, off the village of Ak-Manay (Akhmanai) ( $45^{\circ} 17' N.$ ,  $35^{\circ} 34' E.$ ).
- On the western shore there is the port of Genichesk.
- On the northern shore there are three ports, Berdyansk (Osipenko), Zhdanov (Mariupol) and Taganrog, and the bays formed by Obitochnaya
- 35 kosa, Berdyanskaya kosa and Belosarayskaya (Belosarai) kosa afford good shelter during strong easterly winds.
- On Reka Don there are the ports of Rostov and Azov.
- On the south-eastern shore there is the small port of Akhtari, and on the southern shore of Taganrogskiy zaliv there is the port of Yeysk.
- 40 **Pilotage.**—See pages 14 and 299.
- Ice.**—See pages 27–36, and also under the various ports in the Sea of Azov.
- Currents.**—See pages 39–42: 47: 51–53.
- Range of Water level.**—See pages 37–39, and also under the various
- 45 ports in the Sea of Azov.

*Chart 2234.*

**Cautions.**—During winter, the light-vessels in the Sea of Azov are withdrawn and all buoys are replaced by spar buoys.

As the buoys, beacons, etc., in the Sea of Azov are subject to constant change in character and position, and as pilotage is compulsory, full details of the navigational aids are not given. 5

Due to insufficient information regarding navigational aids and warnings, great caution should be exercised by vessels in the Sea of Azov.

*Charts 2216, 2234.*

**DIRECTIONS.**—**Kerch'-Yenikal'skiy kanal to Taganrogskiy zaliv.**—**Caution.**—Vessels crossing the Sea of Azov should avoid the numerous wrecks indicated on the chart since the depths in the fairway track are only about 40 feet (12m2), mud, or mud and sand, when within about 10 miles of Berdyanskaya kosa (page 330). 10

From Varzovskiy light-and-whistle-buoy (page 310), in the northern approach to Kerch'-Yenikal'skiy kanal, the recommended track leads north-north-eastward to the red and white light-and-whistle-buoy moored 28 miles west-south-westward of Dolgaya Kosa light-structure (page 345), and thence north-eastward to the black and white light-buoy moored 20½ miles westward of the same light-structure (page 346). 15  
Northbound vessels should pass eastward of these three light-buoys; southbound vessels should pass westward of them. 20

Caution should be exercised as the above track leads close to a patch of foul ground (45° 54' N., 36° 52' E.) situated 27 miles northward of Mys Kamennyy (page 335), and to an obstruction over which there is a depth of 23 feet (7m0) situated about 24 miles westward of Dolgaya Kosa light-structure. 25

For directions from the above position to Zhdanov, Taganrog, or ports on Reka Don, see pages 364 and 371. See also *NEMEDRI* for recommended tracks. 30

For directions for approaching Kerch'-Yenikal'skiy kanal from northward, see page 342.

*Chart 2233.*

**SOUTH-WESTERN SHORE OF SEA OF AZOV.**—**Aspect.**—The northern coast of Kerchenskiy poluostrov, between Mys Khroni (45° 26' N., 36° 36' E.) (page 310) and the south-eastern end of Arabatskaya streлка, about 46 miles westward, is high and backed by hills which attain elevations of from about 330 to 500 feet (100m6 to 152m4). 35

In the northern approach to Kerchenskiy proliv, Gora Khroni described on page 297, and Gora Temiroba, about 2½ miles west-north-westward are both prominent. Gora Khroni appears as a long ridge with a cleft peak at its eastern end; Gora Temiroba is rounded and of regular shape and rises to an elevation of 505 feet (153m9) from the western side of the same ridge. Another ridge, with patches of scrub on its slopes, extends westward from Gora Temiroba. Mys Zyuk (Ziuk) and Mys Kazantip, about 10 and 29 miles, respectively, westward of Mys Khroni, are also good marks. 40 45

**Bukhta Bulganak.**—**Submarine cable.**—**Beacons.**—**Prohibited anchorage.**—Bukhta Bulganak is entered between Mys Khroni and Mys Tarkhan (Tarkan), a broad, whitish bluff about 5 miles westward. Mys Khroni slopes down to the sea from high land, described on page 310, and its slopes being strewn with large grey rocks render it easy to identify from northward. There are two groups of mud volcanoes near Mys Tarkhan. 50

A submarine telegraph cable is landed on the eastern side of the head 55

**Chart 2233.**

of Bukhta Bulganak, the landing place being marked by two beacons from which lights are exhibited at night. Anchorage is prohibited within an area, indicated by pecked lines on the chart, in the vicinity of the

5 cable.

**Mys Tarkhan to Mys Chagany.—Coast.—Dangers.—**Bukhta Rifov is entered on the western side of Mys Tarkhan; a rocky reef with depths of from 8 to 15 feet (2m4 to 4m6) extends about 1½ miles west-north-westward from Mys Tarkhan. The village of Bol'shiye

10 Tarkhany (Great Tarkan), in which there are a few windmills, lies in a valley on the southern side of the bay.

Small craft can proceed to the head of Bukhta Rifov by keeping close to its western shore, and may obtain anchorage in depths of 16 feet (4m9), but local knowledge is necessary.

15 Mys Zyuk (Ziuk), about 4½ miles westward of Mys Tarkhan, is the extremity of a low, sandy point which extends about one mile north-north-westward from the general line of the coast; near its extremity is a hillock, steep and rugged on its seaward side but sloping on its landward side. This point terminates in a steep cliff which is separated from

20 the hillock by a deep cleft. From eastward or westward, the hillock appears as an islet and the steep cliff as a detached rock. When seen from an offing northward, however, the point stands out as a dark-coloured hill, and may be identified by two villages, each with a windmill, situated at the root of the sandy point.

25 A narrow shoal of gravel, on which there are depths of 16 feet (4m9), extends about 3 miles north-westward from Mys Zyuk.

Bukhta Chokrak is entered between Mys Zyuk and Mys Bogatube (Bagatubi) (45° 29' N., 36° 19' E.), a high point about 2 miles westward, which extends a short distance northward from the general line of the coast.

30 The shores of the bay are low and sandy with some groups of buildings at the head. Ozero Chokraskoye lies southward of the bay, being separated from it by a narrow neck of sand. On this neck is a pier, 313 feet (64m9) long, which has a depth of 11 feet (3m4) at its head, and about 10 feet (3m0) nearly midway along it; thence the depths shoal gradually

35 to the shore. Two warping buoys are moored off the pier. In winter, the pier is dismantled and the warping buoys withdrawn.

From Mys Bogatube the coast trends westward for about 9 miles to Mys Chagany and is low, rugged and broken by gullies. Mys Chagany is blunt and rocky and may be identified by a number of tumuli standing

40 on it. A bank, with less than 30 feet (9m1) over it, extends as up to 2½ miles off this stretch of coast. The depths on this part of the coastal bank shoal very abruptly.

**Kazantipskiy zaliv —Dangers.—Navigational aids.—Anchorages.**

—Kazantipskiy (Kazantip) zaliv is entered between Mys Chagany and

45 Mys Kazantip about 9 miles westward. Mys Kazantip, which is steep-to, is the termination of a peninsula which separates Kazantipskiy zaliv from Arabatskiy (Arabat) zaliv. The northern part of this peninsula consists of a sloping hill separated from the mainland by a low, sandy isthmus about one mile wide. Southward of this isthmus, and on the

50 western side of the peninsula, there is a second hill, similar in appearance to the first. From an offing, these hills appear as two islands and form a good mark.

The eastern shore of the bay is high and steep-to, with depths of 20 feet (6m1) about half a mile offshore. The southern shore is also high

55 but on the south-western side of the bay the high land recedes inland and gives place to a plain fronted by a sandy beach.

*Chart 2233.*

The village of Adzhubay (Adjubai) lies close within the south-eastern shore of the bay, about  $3\frac{1}{2}$  miles south-south-westward of Mys Chagany; there is a small pier abreast the village with a depth of 8 feet (2m4) at its head. Numerous hamlets and windmills are scattered along the shores of the bay. 5

Kazantipskiy light ( $45^{\circ} 28' N.$ ,  $35^{\circ} 54' E.$ ) is exhibited at an elevation of 321 feet (97m8), from a black, wooden tripod with a rectangular day-mark, 13 feet (4m0) in height, situated on the hill close within Mys Kazantip. 10

A detached 10-foot (3m0) patch, surrounded by depths of from 25 to 28 feet (7m6 to 8m5), lies about  $1\frac{1}{2}$  miles south-eastward of Kazantipskiy light-structure and about three-quarters of a mile offshore; several patches with depths of from 23 to 25 feet (7m0 to 7m6) over them, lie about a quarter of a mile south-eastward of the 10-foot (3m0) patch. A red and white spar buoy surmounted by a ball and cross, marks the 10-foot (3m0) patch. 15

Anchorage, sheltered from east-north-east, through south, to west-north-west, may be obtained in a depth of 30 feet (9m1), mud, abreast the village of Adzhubay, about 2 miles offshore. Vessels of light draught can find shelter from north-easterly winds close off the eastern side of the bay, and from north-westerly winds, close under Mys Kazantip, but there is better shelter from north-easterly winds under the western side of Mys Kazantip. Kazantipskiy zaliv is usually frequented by fishing craft. 20

**Arabatskiy zaliv.—Anchorage.**—Arabatskiy zaliv is entered between Mys Kazantip and Arabatskaya strelka, a long, sandy spit separating Sivash or Gniloye more from the Sea of Azov, and which is described on page 324. Between Mys Kazantip and the south-eastern end of Arabatskaya strelka about 20 miles south-westward, the south-eastern shore of the bay is high and rocky with two projections, Mys Kiten', a high bluff about 7 miles south-westward of Mys Kazantip, and Mys Krasnyy Kut, a bold point with reddish-coloured cliffs about 2 miles farther south-south-westward. At the southern corner of the bay, there is a sloping hill with twin summits. The western side of the bay is formed by the low Arabatskaya strelka. 25

The village of Russkiy Kazantip stands at the foot of a hill on the western side of Mys Kazantip, and may be easily identified by its church. A small pier, with depths of not more than 3 feet (0m9) at its head, is erected here during summer. 30

About half a mile southward of Russkiy Kazantip there is a fish-canning station with a small pier which has depths of 7 feet (2m1) alongside.

The village of Kiten' is situated on the western and southern slopes of Mys Kiten'. Abreast the middle of the village is a pier with depths of 6 feet (1m8) off it. 35

A fish-cannery, with a prominent water tower dominating it, stands on the western part of Mys Krasnyy Kut, and a small hard, with depths of from 5 to 6 feet (1m5 to 1m8) off it, gives access to the cannery; there are some rocks in the approach to the hard. At night, the brilliant lights of the cannery are visible from some distance seaward. 40

The village of Pasur (Nasur) is situated near the coast about  $3\frac{1}{2}$  miles west-south-westward of Mys Krasnyy Kut, and is visible from seaward when bearing about  $140^{\circ}$ . A white tower rises above the other buildings in this village, and a grey building with a penthouse roof stands on the coast abreast the village. See view [31]. 45

The village of Ak-Manay (Akhmanai) stands at the head of the bay 50

*Chart 2233.*

and may be easily identified by a white, masonry windmill. There is a hospital at Ak-Manay ( $45^{\circ} 17' N.$ ,  $35^{\circ} 34' E.$ ).

The village of Arabat stands at the south-eastern end of Arabatskaya strelka and near the ruins of Arabatskaya (Arabat) fortress, in which there is a mosque of brown stone, about 50 feet (15m2) in height, which is prominent. The coast in the vicinity of the village is steep-to and affords good landing. Near the village are the remains of a pier.

The village of Krym Eliyskiy, in which there is a salt mine, stands on Arabatskaya strelka about  $2\frac{1}{2}$  miles north-westward of Arabatskaya fortress. At night, the lights on the buildings of the salt mine are visible from some distance seaward. A pier, which is dismantled in winter, extends about half a cable from the coast abreast the village and has depths of 14 feet (4m3) alongside the outer 160 feet (48m8) of its length, shoaling gradually thence to the shore.

Anchorage, sheltered from east, through south to west-north-west, may be obtained in a depth of 18 feet (5m5), about one mile offshore in Ak-Manayskiy reydy, a small bight abreast the village of Ak-Manay, but northerly and north-easterly winds send in a heavy sea. There is less sea in a depth of 25 feet (7m6) abreast the village.

The nature of the bottom in Arabatskiy zaliv is mud and shells.

*Charts 2233, 2234.*

**Arabatskaya strelka.—Dangers.—Navigational aids.**—Arabatskaya strelka is low and sandy and from about a quarter of a mile to  $4\frac{1}{2}$  miles wide. It extends in a north-north-westerly direction for about 60 miles from Arabatskaya fortress ( $45^{\circ} 18' N.$ ,  $35^{\circ} 30' E.$ ) to Proliv Tonkiy (Genichesk), and separates Sivash or Gnilye more from the Sea of Azov. The southern part of the spit appears to be formed by sand washed up by the sea, and its northern part by a number of islets joined together by sand washed up in the same manner. Its eastern side is an almost straight line.

The southern half of the spit is barren and has only a few widely separated hamlets on it, but on its northern part there are several villages, with clumps of tall trees which serve as good marks for making out this part of the spit.

Masses of dead organic matter are cast up on both sides of the spit and undergo decomposition there, causing a putrid odour over a large area.

Arabatskiy beacon, consisting of a black mast with wooden supports surmounted by a triangle, point up, 60 feet (18m3) in height, and having an elevation of 62 feet (18m9), stands on Arabatskaya strelka about  $23\frac{1}{2}$  miles from Arabatskaya fortress.

The whole of the eastern side of Arabatskaya strelka is fringed by a flat, there being depths of 20 feet (6m1) about one mile offshore, except off Arabatskiy beacon, where a wedge-shaped shoal, with a least depth of 10 feet (3m0) over it, extends about  $7\frac{1}{2}$  miles northward from a position about 18 miles north-north-westward of Arabatskaya fortress and about 6 miles offshore. The north-eastern extremity of this shoal is marked by a red and white spar buoy, surmounted by two cones, points together, moored about  $6\frac{1}{2}$  miles east-north-eastward of Arabatskiy beacon.

Two detached patches, with depths of 18 and 19 feet (5m5 and 5m8) over them, lie about 15 and  $16\frac{1}{2}$  miles, respectively, east-north-eastward of Arabatskiy beacon; there are depths of from 25 to 30 feet (7m6 to 9m1) between these patches and the wedge-shaped shoal.

*Charts 2234, 2214.*

Sivash or Gnilye more, which is very shallow, is divided into two branches, one of which extends westward to Perekopskiy peresheyek,

*Charts 2234, 2214.*

*see* page 260, and the other extends south-eastward in the direction of Feodosiya (page 294). Sivash is connected with the Sea of Azov by Proliv Tonkiy, *see* page 326.

*Chart 2234.*

**UTLYUKSKIY LIMAN AND APPROACH.—Aspect.—Navigational aids.**—Utlyukskiy (Utlyuk) liman is bounded westward by the northern part of Arabatskaya strelka, north-westward and northward by the mainland, and south-eastward by Biryuchiy (Biryuchi) ostrov and Fedotova kosa. Reka Bol'shoy Utlyuk (Bol Utliuka) and Reka 10  
Maly Utlyuk flow into its head.

The entrance to the estuary lies between a point on the eastern side of Arabatskaya strelka about 5 miles southward of its northern extremity, and the western extremity of Biryuchiy ostrov ( $46^{\circ} 05' N.$ ,  $35^{\circ} 02' E.$ ) about  $6\frac{1}{2}$  miles eastward. 15

The central part of Utlyukskiy liman is separated from the southern part by two spits, with depths of 18 feet (5m5) over them, which extend towards each other from Biryuchiy ostrov and from the mainland opposite, leaving a narrow channel with depths of 19 feet (5m8) between them. There are depths of from 19 to 21 feet (5m8 to 6m4) in the southern and 20  
central parts of the estuary and of from 14 to 17 feet (4m3 to 5m2) in the northern part.

The town and port of Genichesk are situated on the western shore of the estuary and on the northern side of Proliv Tonkiy or Genicheskiy (Genichesk), the narrow passage separating the northern extremity of 25  
Arabatskaya strelka and the mainland northward. The town of Genichesk is visible over the south-western end of Biryuchiy ostrov; vessels approaching will first see a tall factory chimney near which is a domed building; then, a short distance farther northward, the cathedral which has a bell tower; and finally, the white building and tower of Genicheskiy light- 30  
house about one mile northward of the town.

Genicheskiy light is exhibited, at an elevation of 70 feet (21m3), from a white, square tower on a white, two-storeyed house, 40 feet (12m2) in height, standing on high ground on the coast on the northern side of the town. 35

Fedotova kosa extends about 23 miles south-westward from Mys Fedotova, the south-eastern extremity of the high land within the eastern side of the head of the estuary. It is divided about midway by a gut, which is now silted up; that part south-westward of the gut is known as Biryuchiy ostrov, the north-eastern part being Fedotova kosa proper. 40

Biryuchiy ostrov is flat, low-lying and difficult to make out from seaward; it appears barren and is covered with grass and scrub. There is a prominent clump of trees on the island, and the small village of Bukhta lies about one mile northward of its south-western extremity.

Biryuchiy light ( $46^{\circ} 05' N.$ ,  $34^{\circ} 59' E.$ ) is exhibited, at an elevation 45  
of 87 feet (26m5), from a white hexagonal stone tower, 82 feet (25m0) in height, situated on the south-western extremity of Biryuchiy ostrov.

A beacon, 65 feet (19m8) in height, the top of which has an elevation of 74 feet (22m6), stands about  $6\frac{1}{2}$  miles east-north-eastward of Biryuchiy light-structure. 50

Rybach'ya bukhta, a small cove on the western side of Biryuchiy ostrov, close northward of its south-western extremity, affords shelter for small craft of a draught not exceeding 6 feet (1m8).

The north-eastern part of Fedotova kosa is very narrow and is covered with coarse grass and scattered bushes. A hamlet, visible from a distance 55



**Chart 2234.**

of about 5 miles, stands at the south-western extremity of the north-eastern part of Fedotova kosa.

**Dangers in the approach.—Buoyage.**—The approaches to Genicheskiy zaliv have been imperfectly surveyed and several groups of shoals, whose positions and depths can best be seen on the chart, lie from 10 to 20 miles north-eastward and south-eastward of Biruchiy light. Some of the shoals are marked by spar buoys.

**Genicheskiy reyd.—Dangers.—Buoy.—Anchorage.**—Genicheskiy reyd consists of the southern part of Utlyukskiy liman and is sheltered from all winds. Although south-easterly winds cause a sea in the roadstead, it is not dangerous, as the bottom is sticky mud and is good holding ground.

A bank, with depths of less than 18 feet (5m5), extends about 3 miles westward from the south-western extremity of Biryuchiy ostrov; there is an 11-foot (3m3) shoal on this bank near its south-western extremity, which extremity is marked by a black and white spar buoy surmounted by two cones, bases together. There are several other patches, with depths of from 10 to 12 feet (3m0 to 3m7) on this bank. Genicheskiy light is obscured over this bank, when bearing less than 321°.

A bank, with depths of less than 18 feet (5m5) over it, extends about 3 cables eastward from the northern part of Arabatskaya strelka, and as much as 3 miles offshore near the entrance of Proliv Tonkiy; thence as far as the spits mentioned on page 325, about 6 miles north-eastward, it decreases in width to about one mile.

Good anchorage may be obtained anywhere in Genicheskiy reyd in depths of not less than 19 feet (5m8). The best berth is in depths of from 20 to 21 feet (6m1 to 6m4), about 3½ miles eastward of the town of Genichesk, but, during south-easterly winds, there is better shelter nearer Biryuchiy ostrov.

The current setting in or out of Proliv Tonkiy, *see below*, is felt in the roadstead, but here does not exceed a rate of half a knot.

**Proliv Tonkiy and Genicheskiy kanal.—Current.—Buoyage.—Lights.**—Proliv Tonkiy or Genicheskiy is about 2 miles long. At its entrance from Utlyukskiy liman it is less than half a cable wide, but farther westward, its width increases to about one cable. The depths in the strait are irregular and are subject to change; in 1937, that part of the strait adjoining Genicheskiy port (46° 10' N., 35° 49' E.) was dredged to a depth of 14 feet (4m3), but towards its entrance from Sivash, there are depths of only from 5 to 6 feet (1m5 to 1m8).

Currents, caused by the wind driving the water from the sea of Azov into Sivash, or in the opposite direction, attain a rate of about 3½ knots in the strait, or even as much as 5½ knots at times. These currents have scoured a channel through the coastal bank off the eastern entrance to the strait and have formed a bar, with depths of from 6 to 7 feet (1m8 to 2m1) over it, about one mile offshore. This channel which is known as Genicheskiy kanal, has been extended through the bar by dredging, and has a width of 130 feet (39m6) at its bottom. In January, 1941, there were depths of 13 feet (4m0) in the channel, but the depths are subject to rapid alteration. *See also range of water level*, page 37.

A light-buoy, painted red, surmounted by two brooms, and exhibiting a *red flashing* light showing a *short flash every three seconds*, is moored on the southern side of the eastern entrance to Genicheskiy kanal.

Genicheskiy kanal and the western limit of the dredged part of Proliv Tonkiy are marked by spar buoys in accordance with the system described on pages 22–24.

**Chart 2234.**

Leading light-beacons for Genicheskiy kanal have been established on the northern extremity of Arabatskaya strelka. The front light is exhibited, at an elevation of 21 feet (6m4), from a black, rectangular frame-work structure with a white, vertical stripe and a pointed top surmounted by a pillar, 29 feet (8m8) in height; the rear light is exhibited, at an elevation of 42 feet (12m8), from a similar structure with a pointed top, 44 feet (13m4) in height. These light-beacons in line, bearing about 260°, lead through Genicheskiy kanal. The light-beacons are surrounded by a number of small buildings and stand out well on the skyline. As the channel is very narrow, vessels should be careful to keep these structures exactly in line.

**Genicheskiy port.—Port facilities.—Storm signals.**—The town of Genichesk (46° 10' N., 34° 48' E.) is the centre of local administration. In 1938, there was a population of about 14,000. There is a hospital in the town.

Genicheskiy port consists of a line of wharves about 1½ cables long; in 1937, there were depths of from 7½ to 10 feet (2m3 to 3m0) alongside the wharves. The harbour is only used by small craft; larger vessels lie in the roadstead and cargo is transported by means of lighters.

Fresh water can be obtained at the wharves; when freshly drawn it smells strongly of sulphurated hydrogen but this odour soon disappears and the water is then quite fit for drinking.

The wharves are connected with the general railway system.

There is occasional sea communication with Kerch' and Osipenko.

Storm signals, *see* page 18, are shown from a mast on the wharves.

**Pilotage.**—*See* pages 14 and 299.

**Ice.**—Off Genichesk the sea does not freeze over completely every year. The ice often breaks up during the winter, and occasionally, the broken ice is swept away for several days or even weeks, and the sea is entirely clear.

The harbour is frozen over for an average of 85 days, the longest period recorded being 142 days, and the shortest, 35 days. The ice attains a thickness of nearly 2 feet (0m6). Communication over the ice between Genichesk and Biryuchiy ostrov is often possible, and has been so during 13 out of 22 winters.

Over a period of 24 years, ice first appeared 6 times in November, 14 times in December, and 4 times in January; over a period of 26 years, it finally disappeared twice in February, 18 times in March, and 6 times in April.

**Range of water level.**—The water level in Genicheskiy rey and Proliv Tonkiy is directly affected by the force and duration of the wind. Prolonged north-easterly and easterly winds raise the level, and south-westerly and westerly winds lower it. The usual variation in water level is one foot (0m3). The annual average maximum fall in level is 4½ feet (1m4), and the average annual maximum rise is about 6 feet (1m8).

**Directions.**—Vessels drawing more than 17 feet (5m2) approaching Genichesk rey, should steer for a position about 19½ miles 096° from Biryuchiy light-structure. From this position, course should be shaped about 270° to pass northward of the southern group of shoals (page 326) and about 2 miles southward of Biryuchiy light-structure, until Genicheskiy lighthouse bears about 327°, or, at night, until within the intensified sector of Genicheskiy light between the bearings of 324 and 331°, when course should be altered to keep the lighthouse bearing about 327°, or in the intensified sector of the light at night, passing westward of the spar buoy marking the western extremity of the coastal bank extending off

*Chart 2234.*

Biryuchiy ostrov. When Biryuchiy light-structure bears about 114°, course may be altered as necessary for an anchorage.

**NORTHERN SHORE OF SEA OF AZOV.—General remarks.—**

- 5 From Mys Fedotova (46° 23' N., 35° 25' E.), described on page 325, the northern shore of the Sea of Azov trends in an east-north-easterly direction for about 85 miles to the extremity of Belosarayskaya (Belosarai) kosa, the north-western entrance point of Taganrogskiy zaliv (Gulf of Taganrog). This coast consists mainly of cliffs of even elevation with tumuli in places,  
10 within which is steppe country.

In several places sand spits project, mainly in a south-south-westerly direction, from the general line of the coast, bending south-westward near their extremities, from which extensive flats project seaward. Owing to the action of the sea, the configuration of the ends of these spits changes  
15 from year to year, sometimes to a considerable extent. These spits are very low, and objects on the elevated coast behind them may be sighted before the lights and beacons on them.

Obitochnyy zaliv, Berdyanskiy zaliv and Belosarayskiy zaliv, entered westward of spits of the same name, as well as Utlyukskiy liman, already  
20 described, afford good shelter from easterly winds, which are the most dangerous in this area.

**Obitochnyy zaliv.—Dangers.—Light.—Anchorage.**—Obitochnyy zaliv is entered between Mys Fedotova and the south-western extremity of Obitochnaya kosa, about 31 miles east-north-eastward.

- 25 The village of Kirillovka, close within Mys Fedotova, and that of Gorelaya (Gorelaia), about 2 miles west-south-westward, each contain some windmills which are visible from about 12 miles eastward and north-eastward. On the coast abreast the village of Kirillovka there is a large and prominent white building with a green roof and tall and slender  
30 chimney, and a short distance farther northward is the tower of an oil well which is also prominent. A white church, situated on a hill in the village of Gorelaya, is a good mark. A pier, with a depth of about 5 feet (1m5) at its head, is erected each year abreast the village of Kirillovka.

- 35 A narrow shoal, with a least depth of 16 feet (4m9) over it, extends about 4 miles north-eastward from a position about 4½ miles south-eastward of Mys Fedotova. The depths in this vicinity are irregular.

For about 9 miles east-north-eastward of Mys Fedotova the coast consists of a sandy strip which separates Molochnoye (Molochnoe)  
40 ozero from the sea. On rising ground on the north-eastern end of this strip is the village of Stepanovka, in which there is a church and a number of windmills. A pier, with a depth of 12 feet (3m7) at its head, is erected each year near some buildings about one mile from this village. There are depths of 21 feet (6m4), sand and shells, about 1½ miles offshore in  
45 this vicinity. North-eastward of Stepanovka the coast becomes bluff and of even elevation.

- Near the coast, about 10 miles north-eastward of the village of Stepanovka, there is a remarkable tumulus, not far from which is a gully in which lies the village of Novo-Konstantinovka. A large church stands  
50 on a hill in this village and is visible from southward. There is a pier, with a depth of 11 feet (3m4) at its head, southward of Novo-Konstantinovka.

- Novo-Konstantinovskiy light (46° 34' N., 35° 43' E.) is exhibited from a black, framework structure 33 feet (10m1) in height, situated  
55 on the coast close southward of the village of Novo-Konstantinovka.

*Chart 2234.*

A 16-foot (4m9) patch lies about  $7\frac{1}{2}$  miles south-eastward of Novo-Konstantinovskiy light-structure.

The town of Botevo (Great Soston), with a population of about 10,000 in 1937, lies about 2 miles inland in the valley of Reka Korsar, which river enters the sea about 7 miles east-north-eastward of Novo-Konstantinovskiy light-structure. This river dries in summer. There is a hospital in Botevo. On the coast southward of this town is a large grain elevator surmounted by five tower-like structures, near which, two piers are erected each year. There are depths of  $11\frac{1}{2}$  feet (3m5) at the head of one of these piers.

A church in the town of Botevo and a small church in the village of Rayonovka, about 5 miles farther eastward, are both visible from seaward. In the village of Orlovka (Badai) about 3 miles north-eastward of Rayonovka, there is a church with a bell tower which is usually seen before the two former churches.

Southward of the village of Rayonovka there is a pier, in the vicinity of which there are depths of 10 feet (3m0) close inshore.

Between the village of Rayonovka and that of Preslav (Shekle) about 10 miles eastward, the coast is high, with peculiar clay landslips and an almost level-topped cliff. Near the latter village, the coast abruptly decreases in elevation and trends southward, forming the root of Obitochnaya kosa.

Good anchorage, with shelter from north-easterly winds, may be obtained in the roadstead southward of the town of Botevo, but this anchorage is open southward and strong winds from this direction send in a short, choppy sea. Better shelter from southerly winds may be obtained off Obitochnaya kosa, *see* below.

South-westerly winds send in a swell which raises a heavy sea throughout Obitochnyy zaliv.

**Obitochnaya kosa.—Dangers.—Navigational aids.—Anchorages.**—Obitochnaya kosa is a low, sandy spit which projects about 10 miles south-westward from a position about 5 miles southward of the village of Preslav. Close within the root of the spit, a row of six tumuli, known as Knyazheskiye kurgany, stands on rising ground; they are visible from a distance of about 13 miles and form a good landmark for identifying the spit. The windmills and churches of the town of Nogaysk (Nogaïsk), about 5 miles north-eastward of the village of Preslav, and the village of Obitochnoye, about  $1\frac{1}{2}$  miles farther eastward, are visible from westward of the spit. On the spit itself are the buildings of three fishing stations which, from a distance of about 5 miles, appear as dark patches resembling haystacks.

The north-eastern part of Obitochnaya kosa is very narrow. Near the extremity of the north-western side of the spit, a tongue projects a short distance northward and forms a small bight which affords shelter to small craft from south-westerly winds.

The whole of Obitochnaya kosa is fringed by a flat composed of shells, on which there are numerous patches with depths of from 10 to 17 feet (3m0 to 5m2), and which extends as much as 2 miles from either side, and about  $6\frac{1}{2}$  miles south-eastward from its extremity. The south-eastern extremity of this flat is marked by a red spar buoy surmounted by a cone, point down, moored about 8 miles south-eastward of the south-western extremity of the spit ( $46^{\circ} 29' N.$ ,  $36^{\circ} 09' E.$ ).

A bank, which is a continuation of the eastern part of the above-mentioned flat, and on which there are several shoals with depths of from 18 to 24 feet (5m5 to 7m3), extends as much as about 20 miles east-

*Chart 2234.*

south-eastward from the south-western extremity of Obitochnaya kosa. There are a number of shoals with depths of from 12 to 18 feet (3m7 to 5m5) on the inner part of this bank and off the outer edge of the flat.

- 5 Obitochnyy light is exhibited, at an elevation of 63 feet (19m2), from a red, metal framework beacon with a red square daymark, 59 feet (18m0) in height, situated on the south-western extremity of Obitochnaya kosa.

- Anchorage, with good shelter from easterly or north-easterly winds, may be obtained in depths of 20 feet (6m1), with Obitochnyy light-structure bearing 180°. Shelter from southerly winds can be obtained near Obitochnyy light-structure or off the western side of the root of Obitochnaya kosa, where there is excellent anchorage in depths of about 17 feet (5m2). Vessels approaching these anchorages should pass at least 2 miles westward of Obitochnyy light-structure.

- 15 **Local magnetic anomaly.**—Local magnetic anomalies exist on Obitochnaya kosa, but their influence is only felt a short distance seaward.

- Caution.**—The only object on Obitochnaya kosa visible from a safe distance southward or south-eastward is Obitochnyy light-structure. Warning of approach to the bank off the spit can be obtained by observing the nature of the bottom, which is sand, or sand and shells on the bank, but mud, or mud with black shells farther seaward. Owing to this lack of landmarks on the spit, vessels bound for Berdyanskiy port from south-westward or southward should approach it with caution and should sound continuously; if approaching from westward, course should not be altered northward for Berdyanskiy port until regular soundings of from 32 to 33 feet (9m8 to 10m1) are obtained.

**BERDYANSKIY ZALIV AND PORT.**—**General remarks.**—

- Berdyanskiy zaliv is entered between the extremity of Obitochnaya kosa and the southern extremity of Berdyanskaya kosa (Berdyansk point) (46° 38' N., 36° 47' E.), about 27 miles east-north-eastward. The bay affords safe shelter from easterly and north-easterly winds but is open southward and south-westward; winds from these latter directions, though very infrequent, sometimes blow with great force and raise a heavy sea. The nature of the bottom of the bay is mud, with sand or shells in places.

The town of Berdyansk (Osipenko), which is fronted by Berdyanskiy port, is situated on the north-eastern side of the head of the bay; see page 333.

- Western and northern shores.**—**Lights.**—Between the roots of Obitochnaya kosa and Berdyanskaya kosa the coast consists of a level-topped cliff, broken only by a gully about 9½ miles north-north-westward of the southern extremity of Berdyanskaya kosa, through which flows Rechka Kutse-Berdyanka (Kutse-Berdianka), a stream which dries in summer.

- 45 Although the churches in the town of Nogaysk and the village of Obitochnoye (page 329), are visible from Obitochnyy zaliv, this town is hidden from southward behind the high coast, and only the upper part of the village church is visible from the latter direction.

- Nogayskaya pristan' is erected each year abreast the village of Obitochnoye, and has a depth of 13 feet (4m0) alongside. Two lights, disposed vertically, are occasionally exhibited, at an elevation of 20 feet (6m1), from a post on Nogayskaya pristan'.

- In the village of Staro-Nikolayevskoye (Old Nikolaevskoe), situated about 3½ miles inland in the valley of Rechka Kutse-Berdyanka, there is a small church and a number of windmills which are visible from seaward.

*Chart 2234.*

**Dangers.—Navigational aids.**—The coastal bank, with depths of less than 18 feet (5m5), fringes the shores of Berdyanskiy zaliv, and extends as much as 3 miles off the northern, and  $4\frac{1}{2}$  miles off the north-eastern side of the bay. An 11-foot (3m4) patch lies near the edge of the bank about  $3\frac{1}{2}$  miles south-south-eastward of the church in the village of Obitochnoye. 5

Berdyanskaya kosa is similar in configuration to Obitochnaya kosa. Its narrow, central portion is formed of washed-up sand and is only about one foot (0m3) in elevation; with fresh south-easterly or southerly winds the sea breaks through it. During spring, the southern half of the spit is inundated, and only its higher portions are above water. 10

There are two small bights, on the western side of the spit, which are used by small craft, with local knowledge, to winter in.

The extremity of the spit is fringed by a bank, with depths of less than 18 feet (5m5), which extends about three-quarters of a mile south-westward,  $1\frac{1}{2}$  miles southward, and  $1\frac{1}{2}$  miles south-eastward from it. The southern extremity of this bank is marked by a light-buoy, painted red and exhibiting a *red flashing* light giving a *short flash every four seconds*; two red spar buoys, each surmounted by a cone, point down, are moored close to this light-buoy. The south-western extremity of the bank, near which there is a depth of 8 feet (2m4), is marked by two black and white spar buoys, each surmounted by two cones, bases together, moored close to each other. 15 20

Nizhniy Berdyanskiy (Nijni Berdyanski) light ( $46^{\circ} 38' N.$ ,  $36^{\circ} 46' E.$ ) is exhibited, at an elevation of 78 feet (23m8), from a white, octagonal, stone tower with a red band, on a white two-storeyed dwelling 63 feet (19m2) in height, situated on the southern extremity of Berdyanskaya kosa. A fog signal is sounded and a radiobeacon transmits at this lighthouse. 25

Verkhniy Berdyanskiy (Verkhni Berdyanski) light is exhibited, at an elevation of 154 feet (46m9), from a white square tower on a single-storeyed dwelling, 42 feet (12m8) in height, situated about 8 miles northward of Nizhniy Berdyanskiy lighthouse. Some distance within this lighthouse there is a water tower which resembles it in appearance, and there are two chimneys westward of the lighthouse. 30 35

**Current.**—The currents in Berdyanskiy zaliv are mainly dependent upon the wind, and do not exceed a rate of one knot.

**Range of water level.**—Prolonged north-easterly and northerly winds lower the water level in the bay, and south-westerly or southerly winds raise it. The range in water level in Berdyanskiy port is much less than at the other Sea of Azov ports. The maximum fall in level is about  $1\frac{1}{2}$  feet (0m5), and the maximum rise about 3 feet (0m9). 40

**Life-saving.**—There is a life-saving station, equipped with a lifeboat, on the western side of Berdyanskaya kosa near Nizhniy Berdyanskiy lighthouse. 45

**Berdyanskiy reyd.—Submarine cable.—Prohibited anchorage.—Spoil ground.**—Berdyanskiy (Berdyansk) reyd comprises the eastern part of Berdyanskiy zaliv. It is free from dangers and easy of access, and affords anchorage in depths of about 18 feet (5m5).

Though southerly and south-westerly winds send in a short and steep sea, the holding ground, of soft, sticky mud, is excellent, and the anchorage is safe. During such winds a vessel should ride with a long scope of cable. South-westerly winds are frequent in summer, and, in ordinary weather, spring up about noon and blow rather strongly at times, moderating towards evening; consequently, vessels in the roadstead should utilize the forenoon for working cargo. 50 55

*Chart 2234.*

A submarine telegraph cable, the track of which is indicated on the chart, is landed a short distance westward of Verkhniy Berdyanskiy lighthouse; this position is marked by two beacons from which lights are exhibited. Anchorage is prohibited within an area, indicated by pecked lines on the chart, near this position.

There is a spoil ground in the eastern part of the road, eastward of the meridian passing through the south-western extremity of Berdyanskaya kosa, and southward of the parallel of Lat.  $46^{\circ} 43' 3''$  N. This spoil ground does not extend within about  $1\frac{1}{2}$  miles of the dredged channel described below.

**Dredged channel.—Navigational aids.**—A channel with a width of about half a cable at the bottom, and depths of  $22\frac{1}{2}$  feet (6m8) in 1968, has been dredged from a position about  $4\frac{1}{2}$  miles west-north-westward of Nizhniy Berdyanskiy lighthouse ( $46^{\circ} 38' N.$ ,  $36^{\circ} 46' E.$ ) to the entrance of Berdyanskiy port, about  $6\frac{1}{2}$  miles north-eastward.

No. 6 red conical light-and-bell buoy, fitted with a radar reflector and exhibiting a *red flashing* light *every three seconds*, is moored on the north-western side of the channel about  $2\frac{1}{2}$  miles north-eastward of the entrance. In addition the channel and the dredged area within Berdyanskiy port are marked by spar buoys in accordance with the system described on pages 22–24. Each buoy is fitted with a radar reflector.

Leading light-beacons have been established for the dredged channel. The front light-beacon consists of a white, rectangular framework structure with a black, central vertical stripe, 56 feet (17m1) in height, situated on a quay about 9 cables south-eastward of Verkhniy Berdyanskiy lighthouse; the rear light-beacon consists of a white, diamond-shaped framework structure surmounted by a rectangle, 55 feet (16m8) in height, and stands on the slope of a hill about 6 cables north-westward of the front light-beacon. These light-beacons in line, bearing  $040\frac{1}{2}^{\circ}$ , lead through the dredged channel. These leading light-beacons are difficult to distinguish on account of intervening buildings, and it is advisable for vessels to be guided by the dredged channel buoys. In order to improve this leading line, a long, white vertical stripe has been painted on the face of a cliff below the rear leading light-beacon.

**Pilots.**—Pilotage is compulsory. The pilot meets incoming vessels at No. 12 buoy at the entrance to the approach channel. See page 14.

**Directions.**—The recommended track for a vessel approaching Berdyanskiy port leads from a position in Lat.  $46^{\circ} 21' 6''$  N., Long.  $36^{\circ} 44' 6''$  E., north-north-westward to the entrance to the dredged channel.

**Berdyanskiy port.—Navigational aids.—Quays.**—Berdyanskiy port is protected from southward and south-westward by a detached breakwater about  $3\frac{1}{2}$  cables long and about half a mile offshore; and from westward by a mole, the inner and wider part of which is known as Shirokiy mol and extends for about 2 cables in a south-westerly direction from the coast abreast the northern end of the breakwater, and the outer and narrower part is known as Uzkiy mol and extends in a southerly direction from the outer end of Shirokiy mol for about  $1\frac{1}{2}$  cables, but the extremity is in ruins, and is marked by two spar buoys. A quay 840 feet (256m0) long extends south-eastward along the coast from the inner end of Shirokiy mol.

A light is exhibited, at an elevation of 31 feet (9m4), from each of two wooden pyramids, 20 feet (6m1) in height, situated one at each end of the breakwater; the light-structure at the north-western end is painted green, and that at the south-eastern end, red.

In 1964 there were depths of 21 feet (6m4) in Nos. 1 and 2 berths, at the

*Chart 2234.*

quay, in Nos. 3 and 4 berths, at the eastern side of Shirokiy mol, and in Nos. 5 and 6 berths, at the eastern side of Uzkiy mol; and of 13 feet (4m0) in No. 9 berth, at the western side of Uzkiy mol; and of 9, 7, and 6 feet (2m7, 2m1, and 1m8), respectively, at berths Nos. 10, 11, and 12, at the western side of Shirokiy mol. 5

There is a mooring buoy about 2 cables eastward of the head of Uzkiy mol.

The western side of the mole is used by coasters, and occasionally by foreign merchant vessels, but cargo cannot be worked here during 10 south-westerly winds.

**Regulations.**—The following are extracts from the regulations in force at Port Berdyansk ( $46^{\circ} 45' N.$ ,  $36^{\circ} 47' E.$ ) in 1964:—

1. Vessels must give 4 hours notice of their time of arrival at the entrance to the dredged channel, together with their draught. 15

3. Foreign vessels must anchor in the outer roads to await allocation of a berth.

4. All vessels must have at least one foot (0m30) of water under the keel at low water.

7. Vessels entering harbour give way to vessels leaving harbour. 20  
Maximum speed in buoyed channel must not exceed 6 knots.

9. Entry to the dredged channel or movement in the harbour during fog or low visibility is forbidden, except in specific cases with the prior authority of the Port Captain.

10. One long blast on the sound signal is to be made by all vessels on 25 approaching the port.

13. Vessels whose length exceeds 100 feet (30m5) must not overtake in the channel.

20. It is forbidden to anchor in the fairway except to avoid accident in emergency. 30

22. Care must be taken to avoid surveying vessels. *See* page 21.

23. Any damage to navigational aids must be reported immediately to the Port Captain.

25. Vessels from foreign port must hoist the quarantine flag and their national flag. 35

**Port facilities.**—**Storm signals.**—Small quantities of coal can be obtained in an emergency.

Fresh provisions of all kinds are available. Fresh water is laid on to the quay, but the supply is limited.

There is a hospital in the town. 40

Minor repairs to hull and machinery can be undertaken. There is a small patent slip in the port. A tug, equipped with powerful pumps, is available.

The moles and quay are connected with the general railway system. During the season of navigation there is regular sea communication with ports in the Sea of Azov and with U.S.S.R. ports in the Black sea. 45  
There is air communication with Zhdanov, Stalino and Kharkov.

Storm signals, *see* page 18, are shown from the light-structure at the head of Uskiy mol.

**Berdyansk.**—The town of Berdyansk (Osipenko) ( $46^{\circ} 45' N.$ ,  $36^{\circ} 47' E.$ ) is situated on level ground a short distance from the bold tableland which backs it. It is a well-known health resort, frequented all the year round, with mineral springs. It had a population, in 1939, of 51,664. 50

**Trade.**—The principal trade is the export of grain.

**Ice.**—In Berdyanskiy zaliv the ice seen is mainly drift-ice. The bay, freezes over from about 2 to 3 weeks after the first appearance of ice, 55



*Chart 2234.*

and in winters when the bay only partially freezes over, the remaining area is covered with floating ice. In the more severe winters the bay becomes completely covered with solid ice. Berdyanskaya kosa protects the bay from being filled up with drift-ice during easterly winds, and in some years the ice will break up in midwinter and clear for several days. In spring, the period between the break-up of the ice and its final disappearance varies from one to six weeks. Ice usually first appears in December, and generally disappears in March. The average length of the season of navigation is 296 days; the longest recorded was 330 days, in 1916, and the shortest, 264 days, in 1929.

**NORTHERN SHORE OF SEA OF AZOV** (*continued from page 330*).—

**Belosarayskiy zaliv.**—**Dangers.**—**Buoy.**—**Light.**—Belosarayskiy zaliv is entered between the southern extremity of Berdyanskaya kosa ( $46^{\circ} 38' N.$ ,  $36^{\circ} 45' E.$ ) and the south-western extremity of Belosarayskaya (Belosarai) kosa, about 26 miles north-eastward; its eastern part is known as Taran'ya bukhta.

Light-buoys moored southward and south-eastward of Berdyanskaya kosa are described on page 342.

An obstruction with a depth of 23 feet (7m0) over it, lies southward of Belosarayskiy zaliv about 14 miles eastward of Berdyanskiy lighthouse.

A short distance eastward of the tableland within the root of Berdyanskaya kosa is the broad valley of Reka Berda, which forms a shallow lagoon before entering the sea by a narrow channel which is, at times, completely blocked by sand.

The village of Petrovskoye (Petrovskoi), on the northern bank of Reka Berda, is divided into two parts, Staro-Petrovskoye and Novo-Petrovskoye; the former lies at the head of the lagoon, and contains a church which is scarcely visible from the sea; the latter lies near the coast, and contains a white building, formerly a church, which is prominent from south-eastward.

Between Petrovskoye village and the root of Belosarayskaya kosa the coast is backed by bare, reddish-coloured landslips intersected by three wide valleys in which are the villages of Urzuf or Zelenoye, Kamyshevataya (Kamishhevata), and Yalta, about  $8\frac{1}{2}$  miles west-north-westward, 7 miles north-westward, and 6 miles northward, respectively, of the south-western extremity of Belosarayskaya kosa. The villages of Urzuf and Yalta are prominent from the offing, and a church in the former has a tall bell tower and usually stands out well against the coast. There is a very prominent windmill, visible for about 10 miles on the western side of the valley in which lies the village of Urzuf; it is particularly conspicuous towards sunset. In the village of Yalta there are several windmills and a white building.

A 3-foot (0m9) patch lies about 2 miles southward of the church in Urzuf village; a number of sunken rocks, with depths of 3 feet (0m9) over them, and which are steep-to seaward, lie between this shoal and a position about 4 miles east-north-eastward of it.

Belosarayskiy (Belosarai) light is exhibited, at an elevation of 70 feet (21m3), from a white, octagonal, stone tower, 63 feet (19m2) in height, situated about  $1\frac{1}{2}$  miles north-eastward of the south-western extremity of Belosarayskaya kosa. A radiobeacon transmits from the lighthouse.

Melekino leading lights, situated  $6\frac{1}{2}$  miles north-north-eastward of Belosarayskiy lighthouse, are described on page 350.

**Taran'ya bukhta.**—**Anchorage.**—Taran'ya bukhta is entered between the south-western extremity of Belosarayskaya kosa and the north-

*Chart 2234.*

western shore of Belosarayskiy zaliv about  $6\frac{1}{2}$  miles north-westward. The whole of this bay is filled by a bank with depths of less than 18 feet (5m5).

Good anchorage, with shelter from winds between north and east, may be obtained in a depth of 16 feet (4m9), mud, with Belosarayskiy light-house bearing  $090^{\circ}$ , distant  $2\frac{1}{2}$  miles. 5

Belosarayskaya kosa, together with the dangers and buoyage southward and eastward of its extremity, are described on page 345.

**SOUTH-EASTERN SHORE OF SEA OF AZOV.**—**Mys Kamennyy** 10  
to **Mys Pekly.**—**Coast.**—From Mys Kamennyy (page 310) the coast trends east-south-eastward for about 3 miles to Mys Pekly (Pekli) ( $45^{\circ} 26' N., 36^{\circ} 56' E.$ ), a low point which projects a short distance north-north-eastward from the general line of the coast. On the western side of Mys Pekly is a fishing station, consisting of a number of buildings with thatched 15 roofs, which are situated close to the water's edge. See view [30].

**Temryukskiy zaliv.**—**Aspect.**—Temryukskiy (Temryuk) zaliv is entered between Mys Pekly and Mys Achuyevskiy, about 32 miles east-north-eastward.

Between Mys Pekly and a prominent detached hill about  $9\frac{1}{2}$  miles 20 east-south-eastward, the south-western shore of the bay is bluff, except about  $5\frac{1}{2}$  miles from Mys Pekly, where it becomes low, with a fishing hamlet situated on its lowest part. A pier, with a depth of 10 feet (3m0) at its head, is erected each year abreast the hamlet.

About one mile east-south-eastward of the detached hill there is a 25 low, sandy beach, through which Akhtanizovskiy (Akhtanizov) liman discharges into the sea. This beach, and a village situated on it, are known as Peresyp'. Small craft with local knowledge may use the entrance to Akhtanizovskiy liman, where there is a small pier; a cable ferry crosses the entrance but the cable is lowered when small craft wish to 30 enter.

Eastward of Peresyp', the coast rises gradually and becomes cliffy, with steep, reddish-coloured slopes, but about 5 miles from the entrance to Akhtanizovskiy liman it abruptly becomes low, and this sudden break in the coastline is prominent from seaward. 35

**Dangers.**—**Navigational aids.**—Temryuskii light is exhibited, at an elevation of 226 feet (68m9), from a white hexagonal tower, 46 feet (14m0) in height, situated on the elevated coast eastward of Peresyp', about 14 miles east-south-eastward of Mys Pekly. This light is known locally as Golubitskiy light, from a village of that name situated close 40 to it.

About  $5\frac{3}{4}$  miles eastward of Temryukskiy light-structure is the entrance to Glukhoy kanal, a dredged channel leading to Temryukskiy port (page 336), and about  $1\frac{1}{2}$  miles farther eastward, Temryukskiy rukav, the main branch of Reka Kuban', enters the sea, forming close within 45 its mouth, the extensive but shallow Kurchanskiy (Kurchan) liman. This branch can only be entered by boats. About half a mile within its mouth is a fish-canning factory with a small pier.

Temryukskaya or Kazbek (Temryuk) banka, composed of hard sand with a least depth of 9 feet (2m7), extends about one mile northward 50 from its southern extremity, which lies about  $3\frac{1}{2}$  miles north-westward of Temryukskiy light-structure and about 2 miles offshore. A white light-buoy with a white topmark, exhibiting a white flashing light every five seconds, marks the northern extremity of the shoal.

A rock, with a depth of 24 feet (7m3) over it, lies about three-quarters 55

*Chart 2234.*

of a mile eastward of the southern end of Temryukskaya banka and about  $2\frac{1}{2}$  miles north-westward of Temryukskiy light-structure.

A timber pile, with a depth of 4 feet (1m2) over it, is situated about 5 three-quarters of a mile westward of the entrance to Glukhoy kanal and about half a mile offshore.

A shoal with a depth of 2 feet (0m6) over it, marked by a spar buoy surmounted by a cone, point up, is situated about  $1\frac{1}{2}$  miles north-eastward of the entrance to Glukhoy kanal.

10 From the mouth of Temryukskiy rukav to Mys Achuyevskiy the eastern shore of the bay is low and mostly covered with reeds, but there are a number of shell beaches on which there are three fishing stations. Three small branches of Reka Kuban' flow into the bay through this stretch of coast.

15 Achuyevskiy light ( $45^{\circ} 41' N.$ ,  $37^{\circ} 39' E.$ ) is exhibited, at an elevation of 54 feet (16m5), from a black, metal, framework structure, 40 feet (12m2) in height, situated on Mys Achuyevskiy. A short distance southward of the light-structure is a prominent white, rectangular building, situated among other buildings of a fishing station.

20 **Caution.**—The area in the vicinity of the detached hill, about  $9\frac{1}{2}$  miles east-south-eastward of Mys Pekly, is subject to volcanic action. In October, 1890, a small islet was formed  $1\frac{1}{2}$  cables offshore, its appearance being accompanied by steam and smoke; this islet, which was 10 feet (3m0) high, disappeared during the following winter and, in the 25 spring, became a shoal with a depth of about one foot (0m3) over it. Another islet was thrown up in 1924, but soon disappeared; this was the fourth upheaval within the living memory of the local inhabitants.

**Range of water level.**—See page 37.

**Currents.**—The currents in Temryukskiy zaliv are almost entirely 30 dependent up on the direction of the wind. Close inshore, the current usually sets parallel with it. The average rate of these currents is about a quarter of a knot, but strong winds may increase the rate to one knot.

During calm weather the outflow of Temryukskiy rukav of Reka Kuban' is appreciable.

35 **Winds.**—The prevailing winds are easterly in autumn and winter and south-westerly or north-easterly in spring and summer.

**Fog.**—Fogs commence in autumn and gradually become more frequent until January; they become less frequent after March. In summer, fogs are rare and occur only at night or in the early morning.

40 **Ice.**—The mean date of the first appearance of ice in Temryukskiy zaliv is December 9th, the earliest and latest dates recorded being December 1st and January 16th, respectively.

The mean date of complete freezing over the bay is January 14th, the earliest and latest dates recorded being December 1st and February 45 27th, respectively.

The mean date of the break-up of ice in the bay is March 4th, the earliest and latest dates recorded being February 2nd and March 23rd, respectively.

The mean date of the final disappearance of ice is March 11th, the 50 earliest and latest dates recorded being January 24th and May 2nd respectively.

**Temryukskiy port.**—**Lights.**—**Anchorage.**—Temryukskiy port ( $45^{\circ} 19' N.$ ,  $37^{\circ} 23' E.$ ) is situated on the north-western side of Temryukskiy rukav of Reka Kuban'; it consists of Glukhoy kanal, a basin and a trans- 55 shipment dyke.

Glukhoy kanal, the entrance channel, is about  $1\frac{1}{2}$  miles long and has

*Chart 2234.*

a width at its bottom of 213 feet (64m9), and a least depth, in June, 1941, of 11½ feet (3m6). The entrance is protected by a pilework mole extending from the coast on either side, the western mole being about 3½ cables, and the eastern mole about 4½ cables in length. This channel is very 5  
subject to silting, especially in its seaward part. In 1934, the depths varied between 8 and 11 feet (2m4 and 3m4).

The small village of Chaykino is situated near the root of the eastern mole. The Hydro-meteorological station, a one-storeyed building with a small tower, stands out conspicuously in this village and is a good 10  
mark for making the entrance.

The basin, which lies at the inner end of Glukhoy kanal, is about 2½ cables long, and from about a half to 1½ cables wide, and had depths, in 1940, of 13 feet (4m0). This basin separated from Temryukskiy rukav by a dyke which serves both for berthing river vessels bringing cargo 15  
down river from the interior, and also for lighters transferring this cargo to vessels lying in the roadstead. In 1940, there was a depth of 10½ feet (3m2) alongside the central berth at this dyke, and of 11 feet (3m4) alongside the piles on its western side.

Two leading light-beacons which, when in line, bear 225°, are situated 20  
about one mile westward, and 2½ miles south-westward, respectively, of the entrance to Glukhoy kanal. The front light is exhibited, from a black rectangular beacon surmounted by a triangle, 23 feet (7m0) in height; the rear light is exhibited from a similar beacon surmounted by a triangle, 23 feet (7m0) in height; the rear light is exhibited from a 25  
similar beacon surmounted by a cylinder, 36 feet (11m0) in height, situated about 1½ miles south-westward of the front light.

Leading light-beacons have been established for Glukhoy kanal. The front light is exhibited, at an elevation of 28 feet (8m5), from a metal, framework pyramid surmounted by a ball, 25 feet (7m6) in height, 30  
situated on the right bank of Temryukskiy rukav; the rear light is exhibited, at an elevation of 35 feet (10m7), from a wooden shield surmounted by a triangle, 30 feet (9m1) in height, situated about half a mile south-eastward of the front light. These light-beacons in line, bearing 139½°, lead through Glukhoy kanal. 35

A light is exhibited, at an elevation of 16 feet (4m9), from a metal column, situated about half a cable within the head of the eastern mole.

A light is exhibited, at an elevation of 13 feet (4m0), from a mast, 10 feet (3m0) in height, situated on a ruined dam in the disused part of Temryukskiy rukav. 40

Anchorage may be obtained in convenient depths, with a church in the town of Temryuk, which is a prominent mark from seaward, bearing 180°. This anchorage is open from west, through north to north-east. A constant current setting out of Akhtanizovskiy liman and Kurchanskiy liman, is felt at this anchorage. 45

For directions for approaching Kerch'-Yenikal'skiy kanal from Temryukskiy zaliv, see page 342.

**Temryuk.—Port facilities.**—The town of Temryuk is situated about 4 miles inland on the eastern side of Temryukskiy rukav, and stands on a hill which separates Akhtanizovskiy liman from Kurchanskiy liman. 50  
It is the administrative centre of a district which includes the whole of Tamanskiy poluoostrov. The main industries are agriculture and fishing. In 1937, the town had a population of about 20,000. There is a hospital in Temryuk.

A small quantity of coal is available if ordered in advance. Fresh 55  
water may be obtained from the river.

*Chart 2234.*

There is a regular sea communication with ports in the Sea of Azov and with Krasnodar on Reka Kuban'.

**Storm signals.**—Storm signals, *see* page 18, are displayed, by day only, from a mast at the south-western corner of the basin.

**EASTERN SHORE OF SEA OF AZOV.**—**Mys Achuyevskiy to Achuyevskaya kosa.**—**Anchorage.**—From Mys Achuyevskiy ( $45^{\circ} 41' N.$ ,  $37^{\circ} 39' E.$ ) the coast trends east-north-eastward for about 6 miles to the mouth of Chernyy Protoka or Protok (Karakuban), one of the  
 10 branches of Reka Kuban', and thence trends north-north-eastward for about 23 miles to the northern extremity of Achuyevskaya kosa (Achuyev point). This stretch of coast is low and marshy, and is covered with reeds and intersected by several rivers. There are numerous fishing stations along the coast, all of which are visible from seaward but are difficult  
 15 to distinguish, one from another.

A short distance eastward of Mys Achuyevskiy is the entrance to Girlo Sladkoye, another branch of Reka Kuban'.

The village of Achuyev (Achuev), a fishing station situated on marshy ground about one mile inland, stands on both banks of Chernyy Protok.  
 20 The mouth of this river is about one cable wide, but it is obstructed by shoals, between which there is a channel with depths of  $3\frac{1}{2}$  feet ( $1m1$ ). Within the mouth there are depths of from 6 to 12 feet ( $1m8$  to  $3m7$ ) as far as the village of Achuyev. In 1937, the village had a population of about 800; there are no land communications and the locality is subject to malaria.  
 25 Anchorage, open westward, may be obtained in depths of from 18 to 20 feet ( $5m5$  to  $6m1$ ), mud, about 2 miles offshore abreast the mouth of Chernyy Protok. The outflow of the river is appreciable several miles offshore.

**YASENSKIY ZALIV.**—**General remarks.**—Yasenskiy (Yasen)  
 30 zaliv is entered between the northern extremity of Achuyevskaya kosa and the southern extremity of Kosa Kamyshevataya (Kamuishevata), about  $19\frac{1}{2}$  miles northward. The shores of this bay are indented on both sides of the entrance, on the south by Akhtarskiy (Akhtari) liman, and on the north by Bukhta Kamyshevataya. At the head of the bay  
 35 is a channel leading to Beysugskiy (Beisug) liman, which is separated from the bay by Yasenskaya (Yasen) kosa. Ozero Khanskoye, a large salt lake, lies north-eastward of Beysugskiy liman, and is separated from it, and from the head of Yasenskiy zaliv, by a narrow sandy ridge.

Yasenskiy zaliv is shallow, the eastern part of the bay being filled by  
 40 a bank which, with depths of less than 18 feet ( $5m5$ ), extends from about 6 to 10 miles from its eastern side, and from which a narrow ridge, with similar depths, extends as much as 15 miles from the eastern shore in the southern part of the bay.

The town and small port of Akhtari ( $46^{\circ} 02' N.$ ,  $38^{\circ} 09' E.$ ) are situated  
 45 on the eastern side of the entrance to Akhtarskiy liman, a large and shallow lagoon on the eastern side of Achuyevskaya kosa, and the town of Yasen stands about 3 miles inland from the head of the bay, about 6 miles northward of the extremity of Yasenskaya kosa.

**Light.**—**Off-lying dangers.**—**Obstructions.**—Akhtarskiy light is  
 50 exhibited, at an elevation of 85 feet ( $25m9$ ), from a white octagonal stone tower 68 feet ( $20m7$ ) in height, situated on the eastern shore of Yasenskiy zaliv, about  $5\frac{1}{2}$  miles north-eastward of the northern extremity of Achuyevskaya kosa.

Banka Zhelezinskaya (Zhelyezin) consists of two patches. The outer

*Chart 2234.*

patch, with a least depth of 18 feet (5m5), lies about 23½ miles west-south-westward of the southern extremity of Kosa Kamyshevataya, and the inner patch, with a least depth of 17 feet (5m2), lies about 4½ miles farther south-eastward. The depths for several miles around these patches are very irregular. 5

A conical light-and-whistle-buoy, painted black and white in stripes, fitted with a radar reflector and exhibiting a *white flashing light every two and a half seconds*, is moored 1½ cables westward of the northern end of Banka Zhelezinskaya. 10

In 1910, a 19-foot (5m8) shoal, the existence of which is doubtful, was reported by S.S. *Leander* to lie about 10 miles north-north-westward of the 18-foot (5m5) patch, and in 1909, a 12-foot (3m7) shoal was reported to lie about 7 miles south-south-eastward of the 17-foot (5m2) patch. 15

Two obstructions, each with a depth of 3 feet (0m9) over them, lie, on the coastal bank in the eastern part of the bay, in positions about 6½ miles west-north-westward, and 7 miles north-westward, respectively, of the northern extremity of Yasenskaya kosa. 15

**Anchorage.**—Akhtarskiy Vneshniy reydy, situated off the western side of Achuyevskaya kosa, is used for anchorage by deep-draught vessels calling at Akhtari to load grain. The eastern limit of this roadstead is marked by a black and white spar buoy, surmounted by two cones, bases together, moored about 15 miles west-south-westward of Akhtarskiy light-structure. This roadstead is open to westerly winds. 20

An anchorage, known as Perepravskiy (Perepravski) reydy, lies southward of Kosa Kamyshevataya in the centre of the entrance to Yasenskiy zaliv and is also open to westerly winds. 25

For directions for approaching Kerch'-Yenikal'skiy kanal from Akhtarskiy Vneshniy reydy, see page 342.

**Ice.**—Observations made at Akhtari, on the eastern side of the entrance to Akhtarskiy liman, show that the average date for the first appearance of ice is December 3rd, the earliest and latest dates being November 2nd and December 27th, respectively. The bay freezes over about January 1st, the earliest date recorded being November 29th, and the latest February 15th. The ice breaks up about March 10th, the earliest and latest dates recorded being February 14th and April 14th, respectively. The bay is finally clear of ice about March 26th, the earliest and latest dates recorded being February 23rd and April 18th, respectively. The mean length of the season of navigation is 244 days. 30

**Range of water level.**—West-north-westerly winds raise the water level, and east-south-easterly winds lower it. The maximum rise, observed is about 7½ feet (2m3), and the maximum fall about 5 feet (1m5). See also pages 37–39. 40

**Currents.**—The currents in Yasenskiy zaliv are inappreciable and are mainly dependent upon the direction of the wind. 45

**Port Akhtarskiy and approaches.**—**Dangers.**—**Buoys.**—**Light.**—Achuyevskaya kosa, which forms the western side of Akhtarskiy liman, is low and sandy and is intersected by numerous channels and lagoons.

The northern side of Achuyevskaya kosa is fringed by a bank which, with depths of less than 6 feet (1m8), extends as much as 2 miles offshore. A 6-foot (1m8) shoal, the existence of which is doubtful, lies about half a mile off the edge of this bank and about 1½ miles offshore. The northern edge of the bank is marked by four white spar buoys, each surmounted by a cone, point up. 50

Akhtarskiy liman is entered between the eastern extremity of Achuyevskaya kosa and Port Akhtarskiy (46° 02' N., 38° 09' E.) about 2 miles 55

*Chart 2234.*

eastward. There are depths of 4 feet (1m2) in the middle of the entrance, but elsewhere in the lagoon the depths are very shallow. A row of sandy islets, which are subject to inundation, extends about one mile south-  
 5 south-eastward from the eastern extremity of Achuyevskaya kosa; the two innermost and largest of these islets are known as Ostrovok Babinyy and Ostrovok Stepanov. The shores of the lagoon are low and marshy, and the western and south-western shores are completely covered with reeds.

On the eastern side of the entrance to the lagoon, the eastern shore of  
 10 Yasenskiy zaliv trends north-north-eastward for about  $7\frac{1}{2}$  miles between Port Akhtarskiy and the root of Yasenskaya kosa, and consists of a cliff of even elevation.

A dredged channel,  $2\frac{1}{2}$  miles long and 140 feet (42m7) wide, with a depth, in 1938, of 11 feet (3m4), leads to Akhtarskiy port. It is marked  
 15 by spar buoys in accordance with the system described on page 22. This channel is subject to silting, and the depths are also subject to changes in water level due to wind action, *see* page 37. Owing to the narrowness of the channel, the spar buoys marking it are frequently displaced by lighters in tow, and should not be relied upon.

Akhtarskiy port consists of a small basin, at the southern end of the dredged channel, protected from northward by a breakwater which extends 3 cables in a westerly direction from the coast. It is dredged to a depth of 11 feet (3m4) but is subject to silt at the rate of about one foot (0m3) in the course of a year. The southern side of the dredged area  
 25 in the basin is marked by a white spar buoy surmounted by a black cone, point up.

Severnaya naberezhnaya, which lies along the southern side of the breakwater, has depths alongside its outer half similar to those in the basin. Yuzhnaya pristan' extends about one cable from the coast parallel  
 30 to and southward of the breakwater, and another pier of equal length lies close southward of it. The depths alongside Yuzhnaya pristan' are shallow, and it is used by fishing craft only; a small channel leads from the basin to the other pier.

A light is exhibited, at an elevation of 15 feet (4m6), from a post, 7 feet  
 35 (2m1) in height, on the head of the breakwater.

**Akhtari.—Port facilities.**—The town of Akhtari ( $46^{\circ} 03' N.$ ,  $38^{\circ} 09' E.$ ) is the administrative centre of the district. There is a hospital in the town. In 1936, the population was about 20,000.

A small quantity of coal is available. Fresh provisions are plentiful.  
 40 Small repairs can be undertaken.

The port is connected with the general railway system. During the season of navigation there is regular sea communication with other ports in the Sea of Azov.

**Yasenskaya Pereprava and approaches.—Buoys.—Lights.—**

Yasenskaya Pereprava, a small village but an important grain-shipping point, is situated on the eastern side of the entrance to Beysugskiy (Beisug) liman, about one cable eastward of the northern extremity of Yasenskaya kosa. *See* also page 359.

Yasenskaya kosa extends about  $7\frac{1}{2}$  miles in a northerly direction from  
 50 its root. Its seaward side consists of a sandy beach but the inner side is low and marshy. The buildings of a fishery station stand on rising ground at the root of the spit. In January, 1938, Yasenskaya kosa was cut off from the mainland near its root by a swashway about half a cable wide, known as Bugazskoye girlo.

On the northern side of the approach to Yasenskaya Pereprava, the  
 55 north-eastern shore of Yasenskiy zaliv trends south-eastward for about

*Chart 2234.*

15 miles from the head of Bukhta Kamyshevataya, *see* below, to the entrance to Beysugskiy liman; for about the first 10 miles of this stretch, it consists of a cliff of even elevation, but it thence becomes a narrow, sandy ridge which separates Ozero Khanskoye from the sea.

The approach to the entrance to Beysugskiy liman is obstructed by a bar, over which the depths are subject to change; within the bar, there are depths of 15 feet (4m6) and over. A channel, marked by spar buoys in accordance with the system described on page 22, has been dredged through the bar; in July, 1938, there was a least depth of 6½ feet (1m9) in the dredged channel.

Leading lights have been established for the dredged channel. The front light (46° 15' N., 38° 17' E.) is exhibited, at an elevation of 33 feet (10m1), from a mast surmounted by a ball, 29 feet (8m8) in height, situated at the northern end of the village of Yasenskaya Pereprava; the rear light is exhibited at an elevation of 36 feet (11m0), from a mast surmounted by a triangle, point up, 33 feet (10m1) in height, situated about three-quarters of a cable east-south-eastward of the front light. These lights in line, bearing 105½°, lead through the dredged channel across the bar.

The village of Yasenskaya Pereprava is administratively a branch of Yeyskiy port, *see* page 358; in 1937, the population was about 350. The village is subject to inundation during spring floods, which at times cause great damage. A grain elevator, standing among other buildings, is visible from seaward. A ferry runs between the village and the extremity of Yasenskaya kosa.

Two wharves, for vessels loading grain, are situated abreast the village; each wharf is 56 feet (17m1) long and has depths alongside of about 12 feet (3m7).

Fresh provisions may be obtained. The village is connected with the general telephone system.

**Beysugskiy liman.—Currents.**—Beysugskiy (Beisug) liman extends about 18 miles south-eastward from its entrance. The entrance channel is about one cable wide, with depths of from 6 to 15 feet (1m8 to 4m6), the greater depths being found near the eastern side of the channel; these depths are subject to change. There are depths of from 3 to 7 feet (0m9 to 2m1) in the central part of the lagoon, and small craft with local knowledge may navigate to its head.

A strong and constant current sets outward through the entrance channel into Yasenskiy zaliv.

**Bukhta Kamyshevataya.—Light.—Anchorage.**—Bukhta Kamyshevataya is entered between the extremity of Kosa Kamyshevataya (Kamuishevata) and the north-eastern shore of Yasenskiy zaliv, about 3 miles north-eastward. Kosa Kamyshevataya is a low, sandy spit which extends about 3 miles south-eastward from the line of the coast. A fishing station, consisting of a number of sheds on high, stone foundations, is situated near the end of the spit and is visible from an offing. Abreast this station there is a pier with a depth of 4 feet (1m2) alongside.

Kamyshevatskiy light is exhibited, at an elevation of 98 feet (29m9), from a red metal framework structure with a red, diamond-shaped daymark, 59 feet (18m0) in height, situated about 3½ miles north-westward of the extremity of Kosa Kamyshevataya.

The northern and north-western shores of Bukhta Kamyshevataya are overgrown with reeds. There are depths of 10 feet (3m0) in the entrance to the bay, but thence the depths decrease to the shore. Small craft with local knowledge, not exceeding 7 feet (2m1) in draught, may



*Chart 2234.*

obtain safe anchorage in the bay, with shelter from westerly or north-westerly winds.

- The village of Kamyshevatskaya (Kamuishevatskaya) stands amongst orchards on rising ground near the root of Kosa Kamyshevatskaya. In 1936, it had a population of about 11,500. There is a hospital in the village.

**EASTERN SHORE OF SEA OF AZOV** (*continued from page 338*).

—**Kosa Kamyshevatskaya to Mys Obryv.**—**Dangers.**—**Buoyage.**—

- From the western side of the root of Kosa Kamyshevatskaya the coast trends north-north-westward for about  $15\frac{1}{2}$  miles to Mys Obryv (Obryv) ( $46^{\circ} 38' N.$ ,  $37^{\circ} 48' E.$ ), and consists of a clay cliff of even elevation. Mys Obryv is a broad but not high bluff, and may be distinguished by its dark-grey colour; it lies at the base of Dolgaya kosa, a long, low and narrow spit extending north-westward from it. Dolgaya kosa is described on page 345. The large village of Dolzhanskaya (Doljansk) is situated on Mys Obryv, and a church in the northern part of this village is the only prominent landmark on this stretch of coast.

- The whole of this stretch of coast is fronted by a bank which, with depths of less than 18 feet (5m5), extends as much as 16 miles offshore westward of the village of Dolzhanskaya. Kosa Yelenina, a narrow and shoal spit of coarse sand and reddish-coloured shells, lies on this bank and extends about 11 miles off the coast westward of the village; its northern edge is steep-to. There are a number of patches, with depths of from 3 to 4 feet (0m9 to 1m2), on the inner part of the spit about 2 miles offshore.

- A pillar light-buoy, painted in black and white vertical stripes, with a superstructure having the upper part black, and the lower part white, exhibiting a *white flashing* light showing a *short flash every two-and-a-half-seconds*, is moored near the extremity of the 18-foot (5m5) coastal bank off Kosa Yelenina, about  $16\frac{1}{2}$  miles west-south-westward of Dolzhanskaya church; its charted position is approximate.

- A pillar light-buoy, with similar superstructure and painted similarly to the pillar light-buoy just mentioned, exhibiting a *white flashing* light showing a *short flash every two-and-a-half seconds*, is moored about 21 miles west-south-westward of Dolzhanskaya church.

*Charts 2234, 2216.*

- DIRECTIONS.**—**Northern approach to Kerch'-Yenikal'skiy kanal.**—Vessels approaching Kerch'-Yenikal'skiy kanal from northward should first sight land in the vicinity of the northern entrance to the strait when about 23 miles from it. The first objects to appear will be Gora Khroni (page 297) and an oblong ridge above Mys Zyuk (page 322); then the hill on which stands Yenikal'skiy lighthouse will appear, at first as an island; and finally, on the eastern side of the entrance to the strait, and appearing as a level strip, the northern coast of Tamanskiy poluostrov, which is separated from the above-mentioned three hills by the wide opening of the strait. On a closer approach, the summits of Gora Gorelaya (page 297) and of the hills inland on Tamanskiy poluostrov, will appear behind the level strip of that coast.

- After fixing the position by landmarks, vessels should shape course to pass close westward of Varzovskiy light-and-whistle-buoy (page 310). Thence she should steer to pass between the entrance light-buoys, Nos. 1 and 2, of the dredged channel and, when sighted, should proceed on the line of Chushkinskiye leading light-beacons, described on page 312.

Vessels approaching Kerch'-Yenikal'skiy kanal from the direction of

*Charts 2234, 2216.*

Akhtarskiy Vneshniy reyds (page 339), should pass at least 2 miles off Mys Akhilleon. Vessels approaching from Temryukskiy zaliv should pass about  $3\frac{1}{2}$  miles off Mys Pekly ( $45^{\circ} 26' N.$ ,  $36^{\circ} 57' E.$ ), about 3 miles off Mys Kamenny, and not less than  $1\frac{1}{2}$  miles off Mys Akhilleon. 5

At night, vessels should approach the northern entrance to the strait by means of the buoyage referred to above, in the *white* sector of Yenikal'skiy light between the bearings of  $159^{\circ}$  and  $234^{\circ}$  until Nos. 1 and 2 light-buoys are sighted and Chushkinskiye leading lights come in line, bearing  $194\frac{1}{4}^{\circ}$ , when they should be kept so and thus proceed into the dredged 10 channel.

For directions for Kerch'-Yenikal'skiy kanal, *see* pages 313-314.

For caution with regard to navigational aids, *see* page 24.

*Chart 2234.*

**TAGANROGSKIY ZALIV.—General remarks.**—Taganrogskiy zaliv 15 (Gulf of Taganrog) is the eastern part of the Sea of Azov; it is entered between the south-western extremity of Belosarayskaya kosa ( $46^{\circ} 52' N.$ ,  $37^{\circ} 18' E.$ ) and the north-western extremity of Dolgaya kosa, about  $15\frac{1}{2}$  miles east-south-eastward, and extends thence in an easterly direction 20 for about 75 miles.

The northern shore of the gulf is high, and is similar to the remainder of the northern shore of the Sea of Azov. Several spits, fringed by shallow flats, extend in various directions from this side of the gulf. The southern shore consists of clay landslips of even elevation, intersected by gullies in places. A number of spits extend from this side 25 also, and are fringed by flats more extensive than those on the northern side.

The chief ports in the gulf are Zhdanov (Mariupol'), on the northern side, about 15 miles within the entrance; Taganrog, on the same side about 9 miles from its head; and Yeysk, on the southern side about 27 miles within the entrance. To these may be added Rostov, which is situated on the northern bank of Reka Don, which flows into the head of the gulf about 26 miles below this port, and Azov, situated on the southern bank of the same river about 5 miles from the head of the gulf. 30

The western part of the gulf as far eastward as the meridian passing through Kosa Lyapina, about 21 miles north-eastward of the south-western extremity of Belosarayskaya kosa, is known as Zhdanovskiy reyds, described on page 347, and that part of the gulf between this meridian and Beglitskiy light-buoy, about 37 miles farther eastward, is known as Bol'shoy Taganrogskiy reyds, described on pages 361-362. For regulations for shipping using these roadsteads, *see* page 361. 40

**Range of water level.**—Large fluctuations in the water level in the gulf are caused by the prevailing winds. Westerly and south-westerly winds raise the level, and northerly and north-easterly winds lower it. Westward of Beglitskaya kosa, described on page 355, it is exceptional for the water level to fall more than 2 feet (0m6) due to this cause. Eastward of this spit, however, winds of moderate strength cause a range in level of from 2 to 4 feet (0m6 to 1m2). An area within 5 miles of the head of the gulf and off the coast in the vicinity of Taganrog may completely dry, and at such times the level in the fairway channel, described on page 361, may fall as much as 7 feet (2m1). 50

Apart from the changes in water level due to the action of the wind, there is an annual variation of the water level due to the increased volume of the discharge of the rivers flowing into the gulf caused by the melting of the snow in their basins. The level is highest in June and lowest in December. *See* also pages 37-39. 55

*Chart 2234.*

The depths shown on the charts are given below the mean level obtained from observations over a long period.

- As the action of the wind causes changes in the water level, as described above, vessels should take precautions against swinging over their anchors.

**Currents.**—See page 39.

During summer, the currents in the gulf are variable and do not exceed a rate of half a knot.

- Ice.**—Ice usually appears at Taganrog ( $47^{\circ} 12' N.$ ,  $38^{\circ} 57' E.$ ) during the first week in December, and at Yeysk and Zhdanov about December 10th. In the entrance of the gulf, ice, usually in the form of drift-ice, appears after December 20th. In exceptional seasons ice may not appear at Yeysk and Zhdanov until the end of December, at Taganrog until the middle of January, and off Belosarayskaya kosa until the end of January.
- The earliest observed dates of the appearance of ice are: off Yeysk, October 29th; at Taganrog, November 1st; at Zhdanov, November 25th; and off Belosarayskaya kosa, November 8th.

- The formation of solid ice proceeds very quickly in the eastern part of the gulf, commencing at Taganrog, and takes, on an average, 5 days from its first appearance. In other parts of the gulf it forms much more slowly, taking from 19 to 22 days.

During December, the ice often breaks up and is carried out to sea, but it forms again soon afterwards. Off Belosarayskaya kosa the water remains partly open throughout the winter.

- The ice in the gulf remains solid until the end of February, and, in some years, until the middle of March. The break up of the ice takes place later in the gulf than elsewhere in the Sea of Azov. The break up usually occurs at Taganrog about March 15th, and at latest, April 8th; at Zhdanov and Yeysk, about March 9th, and at latest March 29th; and off Belosaryaskiy lighthouse, towards the end of February.

Between the break up of the ice and its final disappearance there is an average interval of 12 days at Taganrog, and of 22 days off Belosaryaskiy lighthouse. The gulf is usually quite clear of ice by the end of March, or, in severe winters, by the middle of April.

- Winds.**—The prevailing winds in the gulf in late autumn and in winter are north-easterly and easterly; in other seasons, south-westerly and westerly winds are almost as frequent as those from north-east and east. Regular land and sea breezes are, however, usual from about March to October whenever there is little general wind.

- Gales, which generally blow from eastward, are most frequent in autumn and winter; in summer they are rare and do not last for long. The wind seldom blows strongly from southward or from north-westward.

- Fogs.**—Fogs occur from 7 to 10 days a month in winter, but are rare in summer. They are usually confined to the night and early morning but in winter sometimes last all day; in very cold, calm weather, they may even persist for several days with few breaks. On an average, there is more fog in the western than in the eastern part of the gulf.

- Caution.**—Caution should be exercised when approaching the low points or spits in the gulf, especially at night, as they are scarcely discernible.

Owing to the shallowness of the gulf and its approach, the wrecks that occur form serious obstructions to navigation. A vessel bound for a port in the gulf should therefore proceed with great caution.

- It is stated that objects on the northern side of the gulf are not charted in the correct relative positions to those on its southern side. Simultaneous

*Chart 2234.*

bearings of objects on both sides of the gulf may, therefore, give an erroneous position, and the position of a vessel at any time should be obtained from bearings taken of objects on one side of the gulf only.

For caution regarding navigational aids, *see* pages 24 and 321.

**Directions.**—For directions for Taganrogskiy zaliv, *see* pages 321 and 364.

**ENTRANCE TO TAGANROGSKIY ZALIV.—Belosarayskaya kosa.**

—**Dangers.**—**Buoys.**—Belosarayskaya kosa is similar in formation to Berdyanskaya kosa (page 331), and extends about 5 miles southward from the high land within it, trending south-westward near its extremity. Belosarayskiy lighthouse ( $46^{\circ} 53' N.$ ,  $37^{\circ} 20' E.$ ) is described on page 334. A short distance westward of the lighthouse is a grove of trees, and about half a cable northward of it is a building with a steeple. Along the eastern side of Belosarayskaya kosa, north-eastward of the lighthouse, there is an almost continuous line of cottages interspersed with patches of grass and scattered trees.

The village of Melekino (Byelosarai) is situated under the coastal cliffs on the eastern side of the root of Belosarayskaya kosa; abreast this village there is a pier with a depth of 12 feet (3m7) at its head.

*Charts 2293, 2234.*

A pair of leading lights for the outer approach from eastward to Zhdanov are situated at Melekino and are described on page 350.

*Chart 2234.*

An extension of the bank which, with depths of less than 18 feet (5m5), encumbers the whole of Taran'ya bukhta (page 334), extends about  $1\frac{1}{2}$  miles south-westward from the south-western extremity of Belosarayskaya kosa. This extension is composed of sand and shells, with stones in places, and shoals rapidly from depths of 20 feet (6m1) to 5 feet (1m5). The southern extremity of this bank is marked by two red spar buoys, each surmounted by a red cone, point down.

A detached 18-foot (5m5) sandy shoal lies about  $1\frac{1}{2}$  miles southward of Belosarayskiy lighthouse; its eastern side is marked by two red and white spar buoys, each surmounted by two red cones, points together.

The eastern side of Belosarayskaya kosa is steep-to and affords good landing.

**Dolgaya kosa.**—**Dangers.**—**Buoyage.**—**Light.**—Dolgaya kosa, a long, low and narrow spit, extends about 9 miles north-westward from Mys Obryv (Obriuv) ( $46^{\circ} 38' N.$ ,  $37^{\circ} 48' E.$ ), a bluff which forms the termination of the high land on the southern side of Taganrogskiy zaliv, and on which stands the village of Dolzhanskaya (Doljansk). A pier for the use of boats is erected each year abreast the northern end of this village.

The end of Dolgaya kosa is intersected by two swashways, forming two islands, the south-eastern of which is partly covered in vegetation and has a number of buildings of a fishery station on it. Small craft, with local knowledge, drawing as much as 5 feet (1m5), can use the south-eastern of these swashways, which crosses the spit a short distance north-westward of the lighthouse; this swashway has depths of from 7 to 8 feet (2m1 to 2m4), but is subject to sudden changes. The north-western island is composed of shells over a foundation of sand, and is subject to considerable annual changes due to the action of ice and currents.

A light is exhibited, at an elevation of 23 feet (7m0), from a truncated pyramid on a masonry base, 20 feet (6m1) in height, situated on Dolgaya kosa, about 5 miles north-westward of the church in Dolzhanskaya village.

*Chart 2234.*

A conical light-buoy, painted black and white in bands and exhibiting a *red flashing* light *every two seconds*, is moored about 20½ miles westward of Dolgaya kosa light-structure.

- 5 A narrow shoal, with depths of less than 12 feet (3m7), extends about 5½ miles north-westward from the outer extremity of Dolgaya kosa. On the inner part of this shoal there is a line of low cays, composed of sand and shell, which alter in shape and size from year to year. *Dolgaya kosa* light-buoy, painted white and red in bands and exhibiting a *red flashing*  
 10 light giving a flash *every two seconds*, is moored about 8 miles north-north-westward of the north-western extremity of this shoal. A white spar buoy, surmounted by a black cone, point up, is moored close to this light-buoy.

- Dangers in fairway.—Buoys.**—A submerged obstruction was reported  
 15 in 1938, to lie about 8 miles eastward of Belosarayskiy lighthouse; it is not buoyed, and should be given a berth of at least half a mile.

A 21-foot (6m4) shoal lies about 9 miles east-north-eastward of Belosarayskiy lighthouse.

- A submerged obstruction lies within an area, marked by spar buoys,  
 20 about 11½ miles eastward of Belosarayskiy lighthouse. A vessel entering or leaving the gulf should pass northward of this buoyed area.

- A white spar buoy, surmounted by a black cone, point up, is moored about 11½ miles eastward of Belosarayskiy lighthouse and about 1½ miles northward of the buoyed area mentioned above. This buoy is intended  
 25 as a turning mark for vessels of deep draught outward bound from the gulf, *see* directions, page 364.

- Currents.**—A strong current has frequently been observed setting east-south-eastward along the south-eastern side of Belosarayskaya kosa and towards the bank off that spit. A current sets at a rate of from 3 to  
 30 4 knots along Dolgaya kosa and through the swashways intersecting it; this current is always setting in one direction or the other.

**NORTHERN SHORE OF TAGANROGSKIY ZALIV.—Aspect.**

Within the northern side of the gulf there is a level, uniform, and, in places, salty steppe, which terminates at the coast in steep clay cliffs.

- 35 These cliffs are nowhere more than 180 feet (54m9) in elevation; they are precipitous in some places, but are generally broken up into terraces by landslips. There are isolated hillocks and tumuli, and the cliffs are intersected in places by streams, which form deep gullies or ravines. The coast on this side of the gulf consists of a narrow beach of sand and shells.

- 40 A number of sandy spits extend southward from the general line of this shore, the most extensive being Krivaya kosa, Beglitskaya kosa, and Petrushina kosa, about 35, 55 and 67 miles respectively, east-north-eastward of the south-western extremity of Belosarayskaya kosa. These spits are fringed by extensive flats.

- 45 There are numerous villages along this side of the gulf. The following towns and villages are all on or near the coast and are prominent; the buildings and churches of the town of Zhdanov (47° 05' N., 37° 34' E.), formerly named Mariupol', about 13 miles north-eastward of the south-western extremity of Belosarayskaya kosa; the villages of Shirokoye  
 50 (Shirokinski) and Budenovka, about 11 and 21 miles, respectively, farther eastward; the village of Veselo Voznesenskiy, about midway between Krivaya kosa and Beglitskaya kosa, and of Novo Mar'inskiy (Marinskoe), about 7½ miles east-north-eastward of the extremity of the latter spit; and the buildings of the town of Taganrog, about 3 miles north-  
 55 eastward of Petrushina kosa.

*Charts 2293, 2234.*

**PORT ZHDANOV AND APPROACHES.**—*Belosarayskaya Kosa to Kosa Lyapina.*—From the high land near the village of Melekino ( $46^{\circ} 58' N.$ ,  $37^{\circ} 24' E.$ ), *see* page 345, the coast trends north-eastward for about  $7\frac{1}{2}$  miles to the mouth of Zintseva balka. This stretch of coast consists of a steep, level-topped cliff intersected about midway by the mouth of Balka Samarina (Samarin), a gully which is deep and narrow. 5

From the mouth of Zintseva balka the coast rises sharply and trends east-north-eastward for about 3 miles to the mouth of Reka Kal'mius, whence it trends eastward for about  $4\frac{1}{2}$  miles to the extremity of Kosa Lyapina. The town of Zhdanov is situated on the western side of the mouth of Reka Kal'mius; in the town, the lofty white building of the former cathedral, about half a mile north-westward of the mouth of Reka Kal'mius, is prominent, and a pair of tall chimneys, about  $1\frac{1}{2}$  miles north-eastward of the mouth of that river, are good marks. 10 15

Between the mouths of Zintseva balka and Reka Kal'mius, the coast consists of a beach of fine sand, which is fringed by a bank with depths of 6 feet (1m8) and less, which extends as much as three-quarters of a mile offshore. The eastern part of this bank is known as Rossyp' Domashina. 20

Kosa Lyapina terminates in two low islands, off which a shallow flat extends about one mile southward. There are a number of buildings on Kosa Lyapina.

**Port Zhdanov.**—Port Zhdanov, one of the largest ports in the Sea of Azov, consists of two harbours, Zhdanov port situated off the valley of that name, and a harbour at the mouth of Reka Kal'mius, known as Port v ust'ye Reki Kal'mius. 25

Zhdanov port consists of Avanport, an outer harbour, and Coal harbour (Ugol'naya basseyn), Grain harbour (Khlebnny basseyn) and Repair basin (Remontny basseyn). It is served by two approach channels, one leading to Coal harbour (page 349) and the other to Avanport (page 351). 30

Port v ust'ye Reki Kal'mius consists of Gavan'Shmidta and Port Azovstal', each of which is served by its own approach channel.

**Zhdanovskiy reydy.**—Zhdanovskiy reydy comprises the western part of Taganrogskiy zaliv as far eastward as the meridian of Kosa Lyapina ( $47^{\circ} 05' N.$ ,  $37^{\circ} 42' E.$ ), the remainder of the gulf being known as Taganrogskiy reydy. Bol'shoy Taganrogskiy reydy, the outer part of Taganrogskiy reydy, is described on page 361. 35

Zhdanovskiy reydy is not so well sheltered as Bol'shoy Taganrogskiy reydy, being open to the sea sent in by south-westerly winds which, though infrequent, occasionally blow with considerable force. 40

Vessels entering Taganrogskiy zaliv and intending to load to a draught of 23 feet (7m0) or over, should anchor in Zhdanovskiy reydy, taking care to avoid the 21-foot (6m4) shoal (page 346). *See* regulations for Zhdanovskiy reydy and Bol'shoy Taganrogskiy reydy, pages 350, 352 and 361. 45

**Spoil grounds.**—No. 1 spoil ground lies close inshore south-westward of Zhdanov port and westward of the approach channel to Coal harbour. The positions of other spoil grounds, some of which are disused, can best be seen on chart 2293.

**Chart 2293.** 50  
**Zhdanov port.**—**Quays and depths.**—**Navigational aids.**—For the approach channels to Coal harbour and Avanport, *see* pages 349 and 351.

**Coal harbour.**—Coal harbour (Ugol'naya basseyn) is protected from south-westward by Zapadnyy mol, which extends from the coast in a south-easterly direction for about 3 cables. Vostochnyy mol, which lies parallel with, and about 2 cables from the coast, is about  $4\frac{1}{2}$  cables 55

*Chart 2293.*

long, and protects the basin from south-eastward; its north-eastern end trends eastward and joins the root of Yuzhnyy mol, *see* below, and a protective mole extends about 8 cables in a southerly direction from the  
5 southern end of Vostochnyy mol, on the eastern side of the approach channel.

Coal harbour is separated from Grain harbour, north-eastward by Razdelitel'nyy pirs, a broad dividing jetty, 740 feet (225m) long. The quay between the roots of Zapadnyy mol and this jetty is 2,844 feet  
10 (866m) in length. The entrance to Coal harbour lies between the head of Zapadnyy mol and the protective mole and is 558 feet (170m) wide. In 1967, the mean depth in Coal harbour was 25½ feet (7m7) and, at that date, there were depths of 24 feet (7m3) alongside the quay.

A light is exhibited, at an elevation of 19 feet (5m8), from a post situated  
15 on the southern end of the protective mole on the eastern side of the approach channel; the light-beacon is fitted with a radar reflector, and a *white* reflector.

A light is exhibited, at an elevation of 13 feet (4m0), from a metal column situated at the junction between Vostochnyy mol and the protective mole on the north-eastern side of the entrance to Coal harbour.  
20

A light is exhibited at the head of the dividing jetty (47° 03' N., 37° 30' E.), at an elevation of 27 feet (8m2) from a structure 22 feet (6m7) in height at the end of Razdelitel'nyy pirs.

*Avanport.*—Avanport is protected from south-westward by Yuzhnyy  
25 mol, and from north-eastward by Severnyy mol. These two moles extend in a general south-easterly direction for about 6 cables from the inner basins, their inner ends about 5 cables apart and their outer ends curving towards one another, leaving an entrance, 490 feet (149m3) wide, between them. On the inner side of Avanport, lying parallel with, and about  
30 2½ cables from the coast, there is Vnutrenniy breakwater which separates it from Grain harbour. Near the root of Severnyy mol there is a wharf, alongside which is an oiling berth. In 1967, there were depths of from 13 to 20 feet (4m0 to 6m1) in Avanport, but there were undredged areas close to Yuzhnyy mol and Severnyy mol, and the whole basin is subject  
35 to silting.

A light is exhibited, at an elevation of 32 feet (9m8) from a red tower and dwelling, situated on the head of Yuzhnyy mol.

A light is exhibited, at an elevation of 32 feet (9m8), from a red tower, 23 feet (7m0) in height, situated on the head of Severnyy mol.

40 A light is exhibited from each end of the detached breakwater.

*Grain harbour.*—Grain harbour (Khlebnyy basseyn) lies within the Vnutrenniy breakwater and between Razdelitel'nyy pirs and Vostochnyy pirs. The latter pier is 840 feet (256m0) long, and separates Grain harbour from Repair basin north-eastward. There is a quayside of about 3,150  
45 feet (960m1) in Grain harbour.

About midway along the inner side of Grain harbour is a grain elevator which has an elevation of 215 feet (65m5). A jetty, 475 feet (144m8) long, extends south-eastward from the elevator and carries its transporter gear. A light is exhibited from the head of this jetty. On the inner side  
50 of the basin is a wharf, 790 feet (240m8) long. In 1967, there was an average depth of 25 feet (7m6) in the basin and of 23 feet (7m0) alongside the quays.

There are three entrances to Grain harbour. The first, from Coal harbour, lies between the head of Razdelitel'nyy pirs and Vostochnyy  
55 mol, and is 425 feet (129m5) wide; the second, from Avanport, lies between the north-western end of Yuzhnyy mol and the southern end of Vnutrenniy

## Chart 2293.

breakwater; and the third, also from Avanport, lies between the northern end of Vnutrenny breakwater ( $47^{\circ} 04' N.$ ,  $37^{\circ} 31' E.$ ) and the head of Vostochnyy pirs and is about 1,000 feet (304m8) wide.

A light-buoy, painted white and exhibiting a *white flashing light* 5 showing a *short flash every five seconds*, is moored on the eastern side of the entrance to Grain harbour from Coal harbour and marks a shoal off the angle formed by the junction of Yuzhnyy mol and Vostochnyy mol.

**Repair basin.**—Repair basin (Remontnyy basseyn) is protected from eastward by Vostochnaya ograditel'naya damba, a breakwater extending in a 10 southerly direction from the coast and joining the inner end of Severnyy mol. Its entrance, which lies between the southern end of this breakwater and the head of Vostochnyy pirs, is about 150 feet (45m7) wide. A light is exhibited from either side of the entrance to Repair basin. There are two small piers in the basin. In 1957, there were depths of 19 feet (5m7) 15 in this basin. The basin is used by vessels undergoing repairs.

**Approach channel to Coal harbour.**—**Navigational aids.**—The approach channel to Coal harbour is the main channel for entry into Zhadnov port; it leads through the coastal bank to the entrance to Coal 20 harbour. The dredged channel is  $8\frac{1}{2}$  miles in length, the direction of its axis is  $192\frac{1}{2}^{\circ}$ – $012\frac{1}{2}^{\circ}$ , and the channel was dredged, in 1968, to a depth of  $23\frac{1}{2}$  feet (7m1). See view [32].

The entrance to this channel is marked by No. 15 conical light-and-whistle buoy and No. 16 conical light-and-bell-buoy, fitted with radar reflectors, moored about  $5\frac{1}{2}$  miles east-north-eastward of Belosarayskiy 25 lighthouse; No. 15 on the eastern side of the channel entrance, is painted black and exhibits a *white flashing light every three seconds*; No. 16, on the western side of the entrance is painted red and exhibits a *red flashing light every three seconds*.

The channel is marked on either side by light-buoys and buoys in 30 accordance with the U.S.S.R. new buoyage system; most of the light-buoys are fitted with radar reflectors.

About 7 miles within the entrance, a branch channel leads north-eastward to Port Azovstal'. The entrance to this branch channel is marked by light-and-bell-buoys similar to those of the approach channel leading 35 to Coal harbour, and the channel itself is marked by light-buoys and buoys, many of which are fitted with radar reflectors. It is 328 feet (100m0) wide and, in 1967, had a dredged depth of 28 feet (8m5). The axis of this channel runs in an  $044^{\circ}$ – $224^{\circ}$  direction.

Three leading-light structures, in line bearing  $012^{\circ} 18'$  lead up the 40 approach channel to Coal harbour.

The front light is exhibited, at an elevation of 73 feet (22m3) from a white tower 68 feet (20m7) in height, fitted with a *white* reflector, situated at the root of Razdelitel'nyy pirs.

The middle light is exhibited, at an elevation of 185 feet (56m4) from 45 a square brick tower on a white-fronted 2-storey building 77 feet (23m5) in height,  $9\frac{1}{2}$  cables northward of the front light.

The rear light is exhibited at an elevation of 286 feet (87m2) from a black pylon 65 feet (19m8) in height,  $1\frac{1}{2}$  miles northward of the front light.

The visibility of this leading line is not good by day; the front light- 50 structure is masked by the towers of buildings in the harbour, and the building from which the middle light is exhibited is seen against the background of the coast and is difficult to identify, especially before noon, when its white front is in the shade.

The grain elevator ( $47^{\circ} 04' N.$ ,  $37^{\circ} 31' E.$ ), described on page 348, 55 stands 20 feet (6m1) westward of the leading line. As a vessel approaches



*Chart 2293.*

through the channel, within a distance of about 4 miles from the basin entrance, the middle light becomes obscured by this elevator, and, within a distance of about  $2\frac{1}{2}$  miles from the entrance, the rear light is  
 5 seen through the outer framework of the elevator, becoming more obscured as the vessel approaches the basin. Also, within these distances, should a vessel deviate at all westward of the leading line, both these lights become completely obscured by the elevator. Should the rear lights become obscured, the sensitivity of the leading line, using the front and  
 10 middle lights only, is not good, and a vessel should keep strictly to the axis of the heading line and should be guided by the buoyage.

Melekino Yuzhnyy leading lights for the approach from south-eastward to the dredged channel leading to Coal harbour are situated at Buduikina,  $5\frac{1}{2}$  miles northward of Belosarayskiy lighthouse. The front  
 15 light is exhibited, at an elevation of 54 feet (16m5) from a black metal tower with a black trapezium daymark, 52 feet (15m8) in height; the rear light is exhibited at an elevation of 154 feet (46m9) from a similar structure. Both lights are shown in winter, and both are fitted with radar reflectors.

20 In line, bearing  $305^\circ$  they lead to a position at the entrance to the dredged channel to Coal harbour.

Leading lights for the approach from eastward to the Coal harbour dredged channel are situated at Melekino, about  $6\frac{1}{2}$  miles north-north-eastward of Belosarayskiy lighthouse. The front light is exhibited, at  
 25 an elevation of 205 feet (63m4) from a black metal tower with a black trapezium daymark 52 feet (15m8) in height; the rear light is exhibited at an elevation of 256 feet (78m0) from a black metal tower with a black square daymark, 80 feet (24m4) in height, and fitted with a radar reflector, situated  $3\frac{1}{2}$  cables west-north-westward of the front light; in line, these  
 30 lights bear  $280^\circ$ . A white conical light-buoy, exhibiting a *white flashing* light every five seconds, is moored close southward of this alignment about 8 miles distant from the dredged channel; this light-buoy has no navigational significance.

Peschanye leading lights are exhibited at Golovenkova,  $4\frac{1}{2}$  miles north-eastward of Melekino leading light-structures. The front light is exhibited at an elevation of 225 feet (68m6) from a black metal tower carrying a black trapezium-shaped daymark, 38 feet (11m6) in height; the rear light, fitted with a radar reflector, is exhibited at an elevation of 252 feet (76m8) from a similar structure, with a square daymark 58 feet (17m7) in height.  
 40 In line, these lights bear  $293^\circ 18'$  and indicate the position in the  $012\frac{1}{4}^\circ$  dredged channel where vessels proceeding to Port Azovstal' (page 352) turn on to the  $044^\circ$  approach alignment of that port; they are again referred to on page 352.

**Regulations.—Signals.**—1. In the approach channel to Coal harbour,  
 45 one way movement of ships is introduced when winds exceed force 6, on the Beaufort Scale.

2. Entrance to this channel is then only permitted on the authority of the Port Captain who will inform ships by radio when these regulations are in force.

50 3. A ship with draught exceeding  $22\frac{1}{2}$  feet (6m8) proceeding along the channel must display:—

*By day.*—A black ball, clearly visible.

*At night.*—A red light, visible all round, exhibited above the forward steaming light.

55 4. A ship with draught less than  $22\frac{1}{2}$  feet (6m8) must give way to a ship displaying the above signals.

## Chart 2293.

See also pages 352 and 361.

**Approach channel to Avanport.—Navigational aids.**—This channel, which is liable to silt, is used only by coasting and small craft; in 1967, it had been dredged to a depth of 13 feet (4m0). A conical light-buoy, painted red and white in bands and exhibiting a *red flashing* light, is moored at the southern end of the channel about 12 miles north-eastward of Belosarayskiy lighthouse ( $46^{\circ} 53' N.$ ,  $37^{\circ} 20' E.$ ), and the channel itself is marked by light-buoys and buoys. 5

Leading lights have been established for this approach channel. 10

The front light is exhibited at an elevation of 64 feet (19m5), from a metal framework tower with a white disc daymark, 62 feet (18m9) in height, situated near the northern corner of Grain harbour; the rear light is exhibited at an elevation of 135 feet (41m1), from a square tower on a grey brick dwelling, 41 feet (12m5) in height, situated on the eastern side of Zhdanov port, about 3 cables north-north-westward of the front light. These lights in line bearing  $331\frac{1}{2}^{\circ}$  lead through the approach channel into Avanport. 15

**Port v ust'ye Reki Kal'mius.—Light.**—A training wall extends in a south-south-easterly direction for about  $2\frac{1}{2}$  cables from the eastern side of the mouth of Reka Kal'mius. A breakwater extends from the coast from a position about  $3\frac{1}{2}$  cables farther eastward; it trends south-westward for  $3\frac{1}{2}$  cables thence south-south-eastward, in line with the training wall for another 5 cables. Between the breakwater elbow and the training wall is the entrance to Port Azovstal' which is about 260 feet (79m2) wide. 20 25

A light is exhibited at an elevation of 29 feet (8m8) from a green square framework structure, fitted with a radar reflector and 15 feet (4m6) in height, situated at the bend of the breakwater.

Gavan' Shmidta lies immediately within the entrance of Reka Kal'mius ( $47^{\circ} 05' N.$ ,  $37^{\circ} 35' E.$ ), on the western side of which there is a stone quay 1,580 feet (512m0) long. Northward of this quay there is a small camber, in which small craft can winter. In 1966, there were depths of 11 feet (3m3) in this basin. 30

Port Azovstal' is a small basin on the eastern side of the mouth of Reka Kal'mius. There is an oiling berth, with a depth of 24 feet (7m3) at the north-western corner of this basin, and another berth, with a similar depth, at the northern end of its north-eastern side. 35

After prolonged southerly winds the water level in the mouth of Reka Kal'mius may rise as much as 6 feet (1m8) above the normal level; this, however, occurs very seldom and then usually in the spring. 40

**Approach channels.—Navigational aids.**—An approach channel leading to Gavan' Shmidta has been dredged through the bar off the entrance to Reka Kal'mius, it is about  $3\frac{1}{2}$  miles long and 210 feet (64m0) wide, and in 1966, had a least depth of 6 feet (1m8). Farther towards the river, beyond the junction of this channel with the 20-foot (6m1) dredged channel leading from south-westward (*see below*), the channel was dredged to a least depth of 8 feet (2m4) in 1966. 45

A red conical light-buoy, exhibiting a *red flashing* light *every three seconds*, is moored off the western side of the entrance to the channel, about 6 cables south-south-eastward of the outer end of the breakwater. 50

The eastern side of the channel is marked by black spar buoys surmounted by black cones or by yellow and black flags; and the western side is marked by red spar buoys surmounted by black cones or by yellow and red flags. No 2 Turning light-buoy is moored on the north- 55

*Chart 2293.*

western side of the junction of the south-western and eastern dredged channels.

- Leading lights have been established for the approach channel to Gavan' Shmidta. The front light is exhibited, at an elevation of 48 feet (14m6), from a white, wooden, framework structure, surmounted by a ball, 42 feet (12m8) in height, situated on the northern side of the entrance to the camber in Gavan' Shmidta; the rear light is exhibited, at an elevation of 123 feet (37m5), from a similar structure, 54 feet (16m5) in height, situated in the north-eastern part of the town of Zhdanov, about three-quarters of a mile north-north-westward of the front light. These lights in line, bearing  $338\frac{1}{2}^{\circ}$ , lead through the approach channel into Gavan' Shmidta.

- The south-western approach channel to Port Azovstal' branches off from the approach channel to Coal harbour (page 349) where the latter channel is widened; it leaves the  $012\frac{1}{4}^{\circ}$  alignment when Peschanye leading lights (page 350) are in line bearing  $293\frac{1}{4}^{\circ}$  and leads across the channels leading to Avanport and Gavan' Shmidta. It is 328 feet (100m0) wide, and in 1968, was dredged to a depth of 20 feet (6m1).

- This channel is marked by buoys and light-buoys in accordance with the system described on page 22. The dredged area in the southern part of Port Azovstal' is marked by buoys with the appropriate topmarks.

- Three leading lights for the south-western approach channel to Port Azovstal' ( $47^{\circ} 05' N.$ ,  $37^{\circ} 35' E.$ ) are exhibited from the north-eastern side of the harbour. The lights are exhibited at elevations of 74, 146, and 217 feet (22m6, 44m5, and 66m1) from framework towers, the upper parts of which are painted white and which have heights of 61, 89 and 105 feet (18m6, 27m1 and 32m0), respectively; in line the lights bear  $044^{\circ}$ .

- Pilotage.—Radar assistance.**—Both sea and port pilots are stationed at Zhdanov.

Pilotage is compulsory for all foreign vessels, and for vessels drawing more than 14 feet (4m3).

- Vessels entering the harbour must inform the Captain of the Port, Zhdanov, 4 hours before the time of arrival at the outer light-buoys of the approach channel ( $46^{\circ} 55' N.$ ,  $38^{\circ} 28' E.$ ), and at the same time request the services of a port pilot. Vessels proceeding from Zhdanov for the Black Sea must request the services of a pilot 2 hours beforehand.

- In 1966 there was a radar station at Port Zhdanov providing radar surveillance for ships within a radius of about 20 miles of the port.

There is an office of the U.S.S.R. Black Sea Fleet Hydrographic department near the port, where the latest information with regard to navigation in the Sea of Azov can be obtained.

- Regulations.**—The Port Authority issues local regulations which are revised every year. A full text of the regulations currently in force will be given to the Captains of all vessels coming to the port.

The following are extracts from the regulations which were in force in 1964, in addition to those already mentioned on page 350.

3. During fog and low visibility navigation in the port and exit from it is not permitted unless vessels are fitted with radar.

15. All vessels must have at least half a foot (0m15) of water under the keel to be allowed to enter the channels.

18. Vessels entering the harbour must give one long blast on the siren to indicate their presence to other vessels to avoid collision.

23. No communication with the shore is permitted until pratique has been granted.

*Chart 2293.*

39. Maximum speed of vessels in the dredged channels must not exceed  $4\frac{1}{2}$  knots.

43. Any damage to navigational aids must be reported at once to the Captain of the Port.

50. All vessels must have their fire-fighting and life-saving equipment in serviceable order.

51. All vessels must keep their engines in readiness for operation unless permission to put them out of order for repairs is granted by the Port authority.

53. Rat guards must be fitted to all hawsers.

62. No oil or ballast must be pumped out by any vessel within 50 miles of Port Zhdanov ( $47^{\circ} 03' N.$ ,  $37^{\circ} 30' E.$ ).

**Zhdanov.**—The town of Zhdanov stands partly on a hill on the western bank of Reka Kal'mius, and partly on the low coast westward of the mouth of that river.

It is a large industrial town; in 1967, the population was about 373,000. The chief industries are metallurgy and fish-canning. It is the main centre for the export of coal from the basin of Donets Mertvyi (Donets), and grain from a large part of south U.S.S.R. is also exported. There is a hospital in the port.

**Storm signals.**—Storm signals, *see* page 18, are shown from masts near Razdelitel'nyy pirs (page 348), and on the western side of the entrance to Reka Kal'mius.

**Life-saving.**—There is a life-saving station with a lifeboat specially equipped for work in ice, on the western side of the entrance to Reka Kal'mius.

**Port facilities.**—Large supplies of coal are maintained. Foreign vessels coal in Coal harbour, and U.S.S.R. vessels in Grain harbour. An oil berth is situated in Avanport, on the western side of Severnyy mol, and an oiling quay is situated on the eastern side of Repair basin.

Water is laid on to the quays. Fresh provisions are plentiful.

Repairs to hull and machinery can be undertaken. There are numerous mechanical loading appliances and a floating crane of about 100 tons capacity. There is a large floating dock in Avanport. There is a smaller floating dock in Repair basin; for details, *see* Appendix I. There is a patent slip of 350 tons lifting capacity.

Tugs, icebreakers and salvage vessels are available, the former being equipped for fire fighting.

**De-ratting.**—De-ratting can be carried out. *See* page 27.

**Communications.**—The quays are connected with the general railway system. During the season of navigation there is regular sea communication with all ports in the Sea of Azov, including Rostov, and also with Feodosiya, Yalta and Batumi.

There is air communication with Berdyansk, Rostov and Kharkov.

There is a radio station at Zhdanov, *see* page 26.

*Chart 2234.*

**NORTHERN SHORE OF TAGANROGSKIY ZALIV** (*continued from page 346*).—**Kosa Lyapina to Krivaya kosa.**—**Dangers.**—

**Light.**—**Buoys.**—From Kosa Lyapina ( $47^{\circ} 05' N.$ ,  $37^{\circ} 42' E.$ ) (page 347), the coast trends eastward for about 17 miles to the root of Krivaya kosa. There are several villages and hamlets along this stretch of coast. The village of Shirokoye (Shirokinski) is situated on the eastern side of Balka Shirokaya (Bol Shirokaya) about  $5\frac{1}{2}$  miles eastward of Kosa Lyapina. A pier, with depths of from 6 to 7 feet (1m8 to 2m1) at its head, is erected

*Chart 2234.*

each year off this village. In this vicinity, the coast consists of a narrow, sandy beach off which a flat, with depths of from one to 2 feet (0m3 to 0m6), extends some distance into the gulf.

- 5 Between Balka Shirokaya and the village of Bezymyannyy (Bezimyanni) about 5 miles eastward, there is a continuous cliff on which are two hamlets. In the middle of this village there is a stone windmill which is visible from an offing of about 9 miles; abreast the village is a pier, with depths of from 6 to 7 feet (1m8 to 2m1) at its head.
- 10 About 2 miles eastward of the village of Bezymyannyy the coast is intersected by the deep Balka Samsonova; thence the coast rises towards the village of Budenovka, which is situated on the eastern side of the mouth of Rechka Gruzkiy Yelanchik, about 3½ miles farther eastward. Eastward of Budenovka the cliffs recede inland and the coast becomes low.
- 15 Krivaya kosa extends about 4 miles southward from the general line of the coast, trending south-westward near its extremity. The village of Krivaya kosa is situated near the middle of the eastern side of the spit, and a pier, with depths of 9 feet (2m7) off its head, projects from the shore abreast the village; during summer, there is sea communication between
- 20 this village and Yeysk (Yeisk), Taganrog and Zhdanov. Near the extremity of Krivaya kosa is the small fishing village of Strelka, which is occasionally inundated by the sea.

- A light is exhibited, at an elevation of 60 feet (18m3) from a red metal framework tower with a red disc daymark, 54 feet (16m5) in height,
- 25 situated on Krivaya kosa, about one mile from its extremity.

- The eastern side of Krivaya kosa is comparatively steep-to, but a bank with depths of less than 12 feet (3m7) fills the bight on the western side of this spit and extends about 3½ miles westward, and 2 miles south-westward from its extremity. A shoal ridge of hard sand extends south-
- 30 westward from the extremity of Krivaya kosa to close within the edge of this bank, and the depths here decrease abruptly to 4 feet (1m2) and less. A red conical light-buoy, with a red topmark, exhibiting a *red flashing* light *every five seconds* and a red spar buoy surmounted by a cone, point down, mark the southern side of the bank.

- 35 In 1940, a sunken obstruction was reported in a position about 2½ miles south-eastward of the extremity of Krivaya kosa. It is marked by a spar buoy surmounted by a cross.

For the light-buoys marking the fairway channel southward of Krivaya kosa, *see* page 361.

- 40 Small craft can obtain shelter from easterly and north-easterly winds in the bight westward of Krivaya kosa (47° 02' N., 38° 07' E.).

**Life-saving.**—There is a life-saving station at Strelka, equipped with a lifeboat fitted for work in ice.

- Caution.**—When eastward of a line joining Kosa Lyapina and the
- 45 extremity of Kosa Yeyskaya (Yeisk), *see* page 357, vessels should keep in the regular channels in order to avoid causing damage to the gear of fishing vessels. The fishing vessels, on their part, are forbidden to move with their gear out into the regular channels.

**Krivaya kosa to Beglitskaya kosa.**—**Dangers.**—**Navigational aids.**

- 50 —From the eastern side of the root of Krivaya kosa the coast trends eastward for about 14 miles to the root of Beglitskaya kosa. About midway between these two spits the coast is intersected by a gully, on the eastern slope of which lies the large village of Veselo-Vosnesenskiy (Veselo-Voznesensk). This village is very prominent from seaward by reason
- 55 of its white church and also a large stone windmill which stands on the hillside a short distance eastward of it. Near this village, and in a small

*Chart 2234.*

combe near the coast, are the stone buildings of a farm, abreast which there is a pier for small craft drawing about 5 feet (1m5). About 2½ miles farther eastward, on the slope of another gully, there is another farm and some buildings, near which there is a pier, but the area off this pier is very shallow. 5

Near the western side of the root of Beglitskaya kosa the bluff coast is intersected by the wide valley of Reka Mius; the mouth of this river is constricted by two sandy spits, between which the river flows into the sea through a narrow, shallow channel. 10

The village of Matveyevskiy (Matveeski) stands on the slope of the western bank of Reka Mius, near its mouth. In this village there is a church (47° 10' N., 38° 29' E.) which is visible from seaward, and westward and above it there is a hillock with a windmill close to it.

The village of Lakedemonovka, in which there is a church, is situated on the eastern bank of Reka Mius, about 4 miles from its mouth; it is only visible from seaward when off the mouth of the river. 15

Beglitskaya kosa extends about 1½ miles south-eastward from the general line of the coastal cliff. It can be identified by a large house with a colonnade in the eastern part of Beglitskiy village, which is situated on the cliff within the root of the spit, and by a single windmill a short distance westward of the village. Farther westward, and also on the cliff there is another village, in the western part of which there is a prominent house. 20

Beglitskiy light is exhibited, at an elevation of 65 feet (19m8), from a truncated, pyramidal structure, 59 feet (18m0) in height, situated close within the eastern extremity of Beglitskaya kosa. 25

A bank, with depths of 12 feet (3m7) and less over it, fronts the coast between the village of Krivaya kosa and Beglitskaya kosa, and extends as much as 5 miles south-westward of the mouth of Reka Mius and 4½ miles south-south-eastward of Beglitskiy light-structure. On this bank there are depths of from 3 to 4 feet (0m9 to 1m2) about 4 miles south-westward and of 5 feet (1m5) about 3½ miles south-eastward of Beglitskiy light-structure. The bank is marked off its southern side by Beglitskiy light-buoy, which is painted red and exhibits a *red flashing* light *every five seconds*. A red spar buoy surmounted by a cone, point down, is moored close to the light-buoy. 30 35

A shoal patch, with a depth of 18 feet (5m5), lies southward of this bank, about 8½ miles south-westward of Beglitskiy light-structure, and on the northern side of the fairway channel described on page 361. 40

**Beglitskaya kosa to Donakaya del'ta.—Dangers.—Buoy.—Lights.** —Between the root of Beglitskaya kosa and Mys Petrushin (47° 10' N., 38° 52' E.), about 12½ miles eastward, the coast consists of a steep cliff about 60 feet (18m3) high. Two small spits extend southward from this stretch of coast, Kosa Zolotaya, about 3 miles eastward of the root of Beglitskaya kosa, and Petrushina kosa, which extends southward from Mys Petrushin. There are numerous farms and villages along the cliff in this vicinity. 45

The village of Uchkoz, in the western part of which is a large, stone windmill, is situated at the foot of a low cliff within the root of Kosa Zolotaya, and stands out prominently against a background of vegetation which covers the cliff in this vicinity. 50

Near the coast, between 3 and 5 miles eastward of Uchkoz, are the villages of Russkoye (Russkaya), Novo-Mar'inskiy (Novo-Marinskoe), and Polyakovka (Dobraya-Nadezhda), which are practically continuous. 55

*Chart 2234.*

In the western part of this group of villages is a prominent white church with a bell-tower.

The farmhouse of Dmitriada, the nearest to Mys Petrushin, may be readily identified by a short factory chimney rising from a group of buildings.

Mys Taganrog ( $47^{\circ} 12' N.$ ,  $38^{\circ} 57' E.$ ), about 4 miles east-north-eastward of Mys Petrushin, is a broad bluff, 96 feet (29m3) high, with reddish-coloured landslips. The town of Taganrog stands on the flat summit of the point and Taganrogskiy port fronts its south-eastern side. A number of tall white towers and factory chimneys in the western part of the town, and a number of churches in its eastern part, are visible from the gulf.

The whole stretch of coast between Beglitskaya kosa and Mys Taganrog is fronted by a flat which, with depths of 12 feet (3m7) and less, extends as much as  $5\frac{1}{2}$  miles southward of the root of Kosa Zolotaya, 6 miles southward of Mys Petrushin, and  $6\frac{1}{2}$  miles southward of Mys Taganrog. A red spar buoy surmounted by a cone, point down, marks the edge of this flat southward of Mys Petrushin.

The light-buoys marking the fairway channel southward of this flat are described on page 361.

Taganrogskiy light is exhibited, at an elevation of 161 feet (49m1), from a white, circular tower with a red band, 65 feet (19m8) in height, situated on Mys Taganrog.

Cherepakha light is periodically exhibited, at an elevation of 18 feet (5m5), from a red, metal, framework structure, 17 feet (5m2) in height, situated on Ostrov Cherepakha, a small, low, artificial islet about  $1\frac{1}{2}$  miles south-south-westward of Taganrogskiy lighthouse. The light-structure is removed in winter.

Between Mys Taganrog and Kurichiy Rozhok, a short spit which extends off a small point about 5 miles north-eastward, there is a shallow bay, on the western shore of which are situated the factories of Taganrog. Between the head of this bay and the delta of Reka Don, known as Donskaya del'ta, about 11 miles eastward, the coast is bluff and of even elevation with a number of hummocks, and is intersected in places by narrow, deep gullies. On this elevated coast, near the mouth of Reka Sambek, which flows into the gulf on the western side of the small point within Kurichiy Rozhok, the ruins of a stone windmill may be seen.

A spar buoy, marking the outfall of a sewer, is moored about  $1\frac{1}{2}$  miles east-north-eastward of Taganrogskiy lighthouse ( $47^{\circ} 12' N.$ ,  $38^{\circ} 57' E.$ ).

Taganrogskiy port consists of a harbour fronting the south-eastern side of the town of Taganrog, and roadsteads which occupy the central and eastern part of Taganrogskiy zaliv. The harbour is described on page 362, and Bol'shoy Taganrogskiy rey, which occupies the central part of the gulf, is described on page 361.

**SOUTHERN SHORE OF TAGANROGSKIY ZALIV. — Landmarks.**—The following objects near the southern shore of Taganrogskiy zaliv are good landmarks; for caution regarding the use of these landmarks for obtaining the vessel's position by bearings, *see* page 344. The church in the village of Dolzhanskaya (page 342) on the southern side of the entrance to the gulf; the buildings in the town of Yeysk (Yeisk), about 20 miles farther eastward; and the churches in the villages of Glafirovka, Podlyutka, Margaritovka, and Semi Balok (Bakol), about  $6\frac{1}{2}$ ,  $22\frac{1}{2}$ , 28, and 36 miles, respectively, east-north-eastward of the town of Yeysk.

*Chart 2234.*

**Mys Obryv to Yeysk.**—**Coast.**—From Mys Obryv ( $46^{\circ} 38' N.$ ,  $37^{\circ} 48' E.$ ), page 342, the coast trends eastward for about 20 miles to the town of Yeysk. The whole of this stretch of coast consists of a low but steep cliff of even elevation. The village of Vylazki (Vuilazki) is situated on Mys Vylazki, a prominent, reddish-coloured bluff, about 14 miles eastward of Mys Obryv. 5

**YEYSKIY PORT AND APPROACHES.**—**Coast.**—**Dangers.**—

**Buoys.**—**Light.**—The town of Yeysk is situated at the root of Kosa Yeyskaya (Yeisk), a low, sandy spit which extends about 5 miles in a north-easterly direction from its root and forms the north-western side of Yeyskiy liman. Yeyskiy port, a small, artificial harbour consisting of a basin, enclosed by two moles, with a camber at its head, is situated on the north-western side of the spit close north-eastward of the town. About 2 miles from its root, the spit is intersected by a swashway which, due to the action of winds and currents, is subject to frequent changes. In 1966, this swashway was about one cable wide and had depths of about 4 feet (1m2); it was then tending to increase in size. 10 15

The north-eastern extremity of Kosa Yeyskaya is steep-to, but its north-western side is fringed by a flat with depths of less than 12 feet (3m7), which extends as much as one mile offshore. The northern extremity of this flat is marked by a white spar buoy surmounted by a black cone, point up. 20

The large village of Glafirovka, in which there are a number of wind-mills and a large church with a sharply-pointed belfry, stands on a high point on the eastern side of the entrance to Yeyskiy liman, about 2 miles eastward of the extremity of Kosa Yeyskaya. From this high point, the coast trends north-north-eastward for about 6 miles to Sazal'nik mys, a rounded headland which rises above the general level of the coastal cliffs. About 2 miles northward of the village of Glafirovka the coastline is broken by the mouth of Vodyanaya balka, in which is a village of the same name. 25 30

Sazal'nikskaya (Sazalnik) kosa, a low, broad spit, extends about 2 miles northward from the high land on the eastern side of Sazal'nik mys ( $46^{\circ} 51' N.$ ,  $38^{\circ} 28' E.$ ). The village of Sazal'nik (Shabelskoe), near which is a windmill, is situated partly on the point and partly on the spit. 35

A light is exhibited, at an elevation of 82 feet (25m0), from a black shield, 20 feet (6m1) in height, situated on the northern extremity of Sazal'nikskaya kosa.

A ridge, with depths of about 2 feet (0m6), extends about  $4\frac{1}{2}$  miles west-north-westward from Sazal'nikskiy light-structure. The northern side of the extremity of this ridge is marked by two white spar buoys, each surmounted by a black cone, point up. 40

**Peschanyye ostrova.**—**Buoyage.**—An extensive bank over which there are general depths of from 8 to 12 feet (2m4 to 3m7), but on which there are many shoaler patches, extends about 13 miles westward from Sazal'nikskaya kosa and from the coast south-westward of it. Peschanyye (Peschani) ostrova, a group of sandy islets which are almost awash, lie on this bank about 9 miles westward of Sazal'nikskiy light-structure. 45

Peschany light-buoy and a spar buoy close to it, which mark the fairway channel through Taganrogskiy zaliv, are described on page 362. 50

**Yeyskiy rey d.**—**Anchorage.**—**Spoil grounds.**—**Buoys.**—Safe anchorage, in depths of from 20 to 21 feet (6m1 to 6m4), may be obtained in Yeyskiy rey d, from about 8 to 9 miles north-westward of Yeyskiy port. This roadstead affords better shelter from north-easterly winds than Bol'shoi Taganrogskiy rey d (page 361). 55



*Chart 2234.*

A spoil ground, marked by spar buoys with appropriate topmarks, lies about 4 miles north-north-westward of the entrance to Yeyskiy port. Another spoil ground lies close southward of Peschanyye ostrova; its south-western and south-eastern corners are each marked by a red spar buoy surmounted by a cone, point down.

**Approach channels.**—**Buoyage.**—**Lights.**— There are two approach channels to Yeyskiy port, the north-western and Yeyskiy farvater, the northern channel.

- 10 The north-western approach channel has been dredged from Yeyskiy reydy through the harbour basin to the camber; it is 230 feet (70m1) wide and in 1940, had depths of  $16\frac{1}{2}$  feet (5m0), but it is liable to silt. This channel is marked by spar buoys in accordance with the system described on page 22, and also by a light-buoy, painted red and exhibiting a *red flashing* light showing a *short flash every three seconds*, moored on the north-eastern side of the channel, about  $1\frac{1}{4}$  miles from the harbour entrance.

- Leading lights have been established for the north-western approach channel. The front light is exhibited, at an elevation of 76 feet (23m2), from a framework column surmounted by a triangle, 68 feet (20m7) in height, situated on the northern side of the camber within the harbour basin; the rear light is exhibited, at an elevation of 94 feet (28m7), from a similar structure surmounted by a ball, 82 feet (25m0) in height, situated about 5 cables south-eastward of the front light. These lights in line, bearing  $133\frac{3}{4}^{\circ}$ , lead through the dredged channel and into the basin. When approaching the harbour through the dredged channel, the rear light is obscured by the front light at a distance of 3 miles; within this distance, the rear light is seen through the framework of the front light-structure and, on account of this, vessels should be guided by the buoyage.

- 30 Yeyskiy farvater has been dredged across the bank on which lie Peschanyye ostrova, and leads between these islets and a 5-foot (1m5) shoal on the bank, about  $4\frac{1}{2}$  miles westward of Szal'nik mys ( $46^{\circ} 51' N.$ ,  $38^{\circ} 28' E.$ ). In 1966, there was a least depth of 8 feet (2m4) in Yeyskiy farvater.

- 35 This channel is marked by spar buoys in accordance with the system described on page 22, and, in addition, by two light-buoys. The northern light-buoy, painted red and exhibiting a *red flashing* light showing a *short flash every three seconds*, is moored on the eastern side of the northern entrance to the channel, about  $6\frac{1}{2}$  miles west-north-westward of Szal'nikskiy light-structure; the southern light-buoy painted black and exhibiting a *white flashing* light showing a *short flash every three seconds*, is moored on the western side of the southern entrance to the channel, about  $3\frac{1}{2}$  miles northward of the northern extremity of Kosa Yeyskaya.

- Leading lights have been established for Yeyskiy farvater. The front light is exhibited, at an elevation of 34 feet (10m4), from a wooden, truncated pyramid on a concrete base, surmounted by a triangle, point down, 35 feet (10m7) in height, situated on the northern side of Kosa Yeyskaya near its extremity; the rear light is exhibited, at an elevation of 42 feet (12m8), from a similar structure surmounted by a ball, 40 feet (12m2) in height, situated about 4 cables southward of the front light. These lights in line, bearing  $185^{\circ}$ , lead through Yeyskiy farvater.

- Yeyskiy port.**—**Buoys.**—**Lights.**—The two moles enclosing the basin of Yeyskiy port extend about  $4\frac{1}{2}$  cables in a north-westerly direction from the coast and curve towards each other at their heads, between which lies the entrance, 280 feet (85m3) wide. There is a quay, about 300 feet (91m4) long, on the north-eastern side of the camber entrance, off which quay an

*Chart 2234.*

area was dredged, in 1966, to a depth of 18 feet (5m5). The dredged channel, described on page 358, is continued through the basin to the camber. The limits of the dredged areas in the basin are marked by spar buoys with appropriate topmarks; outside those limits there are depths in the basin of from only 4 to 7 feet (1m2 to 2m1). 5

The camber is 1,085 feet (330m7) long in a north-westerly and south-easterly direction and 420 feet (128m0) wide, and had depths, in 1966 of 17 feet (5m2). The entrance is 350 feet (106m7) wide.

Foreign vessels are berthed at the quay on the north-eastern side of the camber, which is used mainly by small craft transshipping grain to vessels lying in the roadstead. The quay on the south-western side is used by passenger steamers and harbour craft. 10

A light is exhibited, at an elevation of 21 feet (6m4), from each of two black, framework columns, 12 feet (3m7) in height, situated one on either side of the entrance to the basin (46° 44' N., 38° 16' E.). A light is also exhibited on each side of the entrance to the camber. 15

**Harbour regulations.—Pilotage.**—Special regulations are in force in Yeyskiy port, copies of which should be obtained from the harbour office.

The harbourmaster pilots foreign vessels into the harbour. 20

**Range of water level.**—Considerable variations in water level, chiefly due to the action of the wind, are experienced at Yeysk. The greatest rise observed is 7 feet (2m1), and the greatest fall, 5 feet (1m5).

See also page 37.

**Yeysk.—Port facilities.—Storm signals.—Radio station.**—The town of Yeysk is situated on rising ground at the root of Kosa Yeyskaya. It is an administrative centre, the village of Yasenskaya Pereprava (page 340) being administered as a branch of Yeyskiy port. There is a hospital in the town. In 1935, the population was about 55,000. 25

Fresh provisions are plentiful. Limited supplies of fresh water can be obtained. 30

Small repairs can be undertaken. There is a patent slip of 35 tons capacity in the fishing craft camber. A tug, equipped for fire-fighting is available.

Storm signals, *see* page 18, are shown from a mast at the entrance to the camber. 35

Yeysk is connected with the general railway system. There is regular sea communication with Kerch' and with ports in the Sea of Azov.

**Life-saving.**—There is a life-saving station in Yeyskiy liman, on the south-eastern side of Kosa Yeyskaya; it is equipped with a motor lifeboat and a boat for use in ice. 40

A lifeboat is also stationed on Sazallnikskaya kosa.

**Yeyskiy liman.—Anchorage.**—Yeyskiy liman, into the head of which flows Reka Yeya, is entered between the north-eastern extremity of Kosa Yeyskaya (46° 41' N., 38° 21' E.) and the high point on which is the village of Glafirovka. The greater part of the estuary is shallow and the depths are subject to considerable changes. Yeyskiy liman is only used by light-draught fishing craft. There are several villages near its shores. 45

Kosa Naydenaya (Naidena), a narrow sand spit, extends about 2½ miles in a southerly direction from the village of Glafirovka, trending eastward towards its extremity. On this spit, a short distance southward of its root, there is a two-storeyed stone house, surrounded by store-houses, abreast which is a pier with a depth of 5 feet (1m5) at its head. 50

The south-eastern side of Kosa Yeyskaya is fringed by a bank, known as Babina rossyp', with depths of less than 6 feet (1m8), which extends about one mile offshore. 55

*Chart 2234.*

Small craft may obtain anchorage, in depths of from 10 to 11 feet (3m0 to 3m4), mud, abreast the pier a short distance southward of Glafirovka.

**SOUTHERN SHORE OF TAGANROGSKIY ZALIV** (*continued*

- 5 *from page 357*).—**Coast.**—**Dangers.**—**Buoys.**—From Sazal'nikskiy light-structure (46° 53' N., 38° 31' E.), the coast trends east-north-eastward for about 15½ miles to Chimburskiy mys, a small point which projects a short distance northward from the general line of the coast. The eastern part of this stretch of coast is intersected by three gullies, named
- 10 Balka Kruglaya, Balka Mokryy (Mokri), Chubur, and Balka Sukhoy (Sukhoi) Chubur, situated respectively, about 6½, 3, and one mile south-westward of Chimburskiy mys.

- The large village of Podlyutka (Port Katon) in which there is a prominent church with two sharply-pointed spires, is situated at the mouth of
- 15 Balka Kruglaya.

- The villages of Novo Margaritovka and Margaritovka are situated, respectively, at the mouths of Balka Mokryy Chubur and Balka Sukhoy Chubur. On high ground between these two villages are two prominent hillocks close together. The village of Margaritovka may be readily
- 20 distinguished by its church, and by a number of windmills close to it on Chimburskiy mys; abreast this village is a pier with a depth of 4 feet (1m2) alongside it.

- Chimburskaya kosa, a small sandy spit, extends about three-quarters of a mile from the coast north-eastward of Chimburskiy mys.

- 25 Chimburskaya mel', a flat with depths of less than 12 feet (3m7), extends about 6 miles west-north-westward from Chimburskaya kosa. The western side of this flat joins the coastal bank which extends, with similar depths, as much as 3 miles offshore between Sazal'nikskaya kosa and Chimburskaya kosa.

- 30 Grecheskaya banka, with a least depth of 10 feet (3m0), lies close northward of the western extremity of Chimburskaya mel'. Its north-western extremity, which is marked by a white spar buoy surmounted by a black cone, point up, lies about 6½ miles north-westward of the extremity of Chimburskaya kosa.

- 35 Grecheskaya light-buoy and a spar buoy moored close to it, off the northern side of Grecheskaya banka, mark the fairway channel through Taganrogskiy zaliv and are described on page 362.

- From Chimburskiy mys the coast trends east-north-eastward for about 10½ miles to the extremity of Ochakovskaya kosa, and consists of
- 40 a low cliff of even elevation. The village of Semi Balok (Bakol), in which there is a church, stands on a hill rising from the coast about 3½ miles south-westward of the extremity of Ochakovskaya kosa, and may be distinguished from a considerable distance seaward.

- Ochakovskaya kosa extends about 1½ miles northward from the foot
- 45 of a hill, on which is the village of Pavlo-Ochakovskaya, which contains a tall windmill. On Ochakovskaya kosa are the buildings of a fishing station, abreast which a small pier is erected each year.

- A shoal bank with depths of less than 6 feet (1m8), extends about 2 miles north-north-westward from the extremity of Ochakovskaya kosa
- 50 (47° 02' N., 39° 06' E.).

- From Ochakovskaya kosa the coast, which consists of clay slopes of even elevation, trends eastward for about 8 miles to the southern corner of the head of Taganrogskiy zaliv, on the southern side of Donskaya del'ta.

- 55 Donskaya del'ta is described on page 364.

*Chart 2234.*

**TAGANROGSKIY PORT.**—Taganrogskiy port includes an artificial harbour on the south-eastern side of the town of Taganrog, and roadsteads which occupy the central and eastern part of Taganrogskiy zaliv. Bol'shoy Taganrogskiy reyd occupies the central part of the gulf.

**Bol'shoy Taganrogskiy reyd.—Anchorages.**—Bol'shoy Taganrogskiy reyd includes that part of Taganrogskiy zaliv lying between the meridians passing through Kosa Lyapina (page 347) and Beglitskiy light-buoy (page 355). This roadstead is comparatively open but the holding ground is good and but little sea is experienced in it. In order to allow vessels to work cargo as near to the harbour as possible, two anchorages have been established in Bol'shoy Taganrogskiy reyd which, for this purpose, is divided into the outer and inner roads.

The outer road is situated near the meridian passing through the village of Shirokoye ( $47^{\circ} 06' N.$ ,  $37^{\circ} 49' E.$ ) (page 353). Anchorage may be obtained in depths of 23 feet (7m0) between positions about  $9\frac{1}{2}$  and  $12\frac{1}{2}$  miles southward of the mouth of Balka Shirokaya ( $47^{\circ} 05' N.$ ,  $37^{\circ} 49' E.$ ).

The inner road is situated westward of Beglitskiy light-buoy. Vessels lying here should pay great attention to changes in the water level, *see* page 343.

Communications with vessels lying in Bol'shoy Taganrogskiy reyd is maintained by launches and tugs. Grain exported from Taganrog and Rostov is brought alongside vessels lying in these roads in lighters and sailing craft, the former being equipped for working cargo. The work is sometimes interrupted by fresh winds.

**Regulations.**—The following regulations for vessels using Bol'shoy Taganrogskiy reyd and Zhdanovskiy reyd are in force:—

A foreign vessel arriving in Bol'shoy Taganrogskiy reyd to load grain must anchor in either the outer or inner roads according to her draught when fully laden.

A vessel loading to a draught of 18 feet (5m5) should anchor westward of the meridian passing about  $1\frac{1}{2}$  miles westward of the extremity of Beglitskaya kosa.

A vessel already laden to a draught of 18 feet (5m5), and desiring to take more cargo, must shift berth to the outer road, where she may load to a draught of 22 feet (6m7).

A vessel intending to load to a draught of 23 feet (7m0) or over should anchor in Zhdanovskiy reyd, *see* page 347.

**Fairway channel.—Buoyage.**—A winding channel, marked by light-buoys and spar buoys, leads between the flats extending from the northern and southern shores of Taganrogskiy zaliv, passing through Zhdanovskiy reyd and Bol'shoy Taganrogskiy reyd and, from the eastern end of the latter road, to the entrance to the approach channel to Taganrogskiy port and Rostovskiy Morskoy (Morskoi) kanal. The channel has a least depth of 23 feet (7m0) in Zhdanovskiy reyd, of from 23 to 18 feet (7m0 to 5m5) in Bol'shoy Taganrogskiy reyd, and of 16 feet (4m9) between the eastern end of the latter road and the entrance to the approach channel to Taganrogskiy port and Rostovskiy Morskoy kanal.

The fairway channel is marked as follows:—The light-buoy in the entrance to the gulf and the spar buoys marking the obstruction on the southern side of the fairway, about 7 miles within the entrance, are described on page 346.

Krivaya Kosa light-buoy, painted red and exhibiting a *red flashing light every five seconds*, with a red spar buoy surmounted by a cone, point down, close to it, is moored on the northern side of the channel,

*Chart 2234.*

about  $8\frac{1}{2}$  miles south-westward of the light-structure on Krivaya kosa (page 354).

Peschanyy light-buoy, painted white and exhibiting a *white flashing* light *every five seconds*, with a white spar buoy surmounted by a black cone, point up, close to it, is moored on the southern side of the channel, about 5 miles south-eastward of the light-structure on Krivaya kosa, and marks the northern side of the flat extending northward from Peschanyye ostrova (page 357).

10 Beglitskiy light-buoy, marking the bank extending southward from Beglitskaya kosa, is described on page 353.

Grecheskaya light-buoy, painted white and exhibiting a *white flashing* light *every five seconds*, with a white spar buoy surmounted by a black cone, point up, close to it, is moored on the southern side of the channel  
15 off Grecheskaya banka (page 360), about  $8\frac{1}{2}$  miles north-westward of the extremity of Chimburskaya kosa.

Petrushina light-buoy, painted red and exhibiting a *red flashing* light *every five seconds*, with a red spar buoy surmounted by a cone, point down, close to it, is moored on the northern side of the channel, about  
20  $8\frac{1}{2}$  miles southward of Taganrogskiy lighthouse ( $47^{\circ} 12' N.$ ,  $38^{\circ} 57' E.$ ).

**Harbour of Taganrogskiy port.—Quays and depths.—Lights.—**

The harbour consists of Novyy (New) basseyn, Petrovskiy (Petrovski) basseyn, Remontnyy (Repairing) basseyn and Vorontsovskaya naberezhnaya.

25 Novyy basseyn, the outer of the three basins, is protected by two moles, about 3 cables apart at their inner ends, which curve towards each other, leaving an entrance, 400 feet (121m9) wide, between their heads. The whole of the inner side of the northern mole, which is 1,312 feet (400m0) long, is available for berthing. Ugol'naya naberezhnaya, which  
30 forms the northern part of the north-western side of this basin, is 810 feet (246m9) long; a breakwater, 680 feet (207m3) long, forms a south-westerly extension of this quay and separates Novyy basseyn from Petrovskiy basseyn north-westward. In 1966, there were depths of 13 feet (4m0) in this basin, except within the curve of the southern mole, where there  
35 are depths of from 6 to 7 feet (1m8 to 2m1).

Petrovskiy basseyn is divided from Remontnyy basseyn, south-westward, by a jetty, known locally as the Damba; this jetty extends 777 feet (236m8) south-eastward from the coast in line with the inner end of the southern mole of Novyy basseyn. Kazennaya naberezhnaya,  
40 which forms the north-eastern side of this basin, is 690 feet (210m3) long, and Khlebnaya naberezhnaya, which forms its north-western side, is 1,042 feet (317m6) long. This basin, which is the most sheltered part of Taganrogskiy port, had depths, in 1966, of between 10 and 12 feet (3m0 and 3m7).

45 Remontnyy basseyn is protected from southward and south-eastward by Petrovskiy (South Petrovski) mol, through which, on the south-eastern side of the basin, there is an entrance available for vessels of light draught. Remontnaya naberezhnaya, which forms the north-western side of this basin, is 1,260 feet (384m0) long. In 1966, there  
50 were depths of 13 feet (3m9) in this basin, but alongside its quays the depths are less. This basin is used by vessels undergoing repairs.

Vorontsovskaya naberezhnaya extends in a west-north-westerly direction for about 6 cables from the root of the northern mole. It is completely sheltered from southerly and south-westerly winds, but is  
55 unprotected north-eastward and south-eastward. Only the first cable of its length from the root of the northern mole is used for berthing;

*Chart 2234.*

here there are two piers used by passenger vessels, off which an area is kept dredged to a depth of 12 feet (3m7).

A light is exhibited from the heads of the moles on each side of the entrance to Novyy basseyn, from each side of the entrance to Petrovskiy basseyn from Novyy basseyn, and from the head of the Damba. 5

**Approach channel to Taganrogskiy port. — Depth Signals. — Navigational aids.**—A dredged channel about 5 miles long and 180 feet (54m9) wide, leads across the flat extending southward from Mys Taganrog (page 356) to the entrance to Novyy basseyn. The prevailing currents set across the channel, which is, therefore, very subject to silting. In 1947, there was a least depth of 8 feet (2m4) in this channel and, in 1938, a least depth of 13 feet (4m0) between its southern entrance and the eastern end of the fairway channel through Taganrogskiy zaliv. 10

The depths in this dredged channel are shown in metrical measure by numeral pendants of the International Code of Signals, displayed at a mast at the head of the southern mole of Novyy basseyn. 15

The eastern side of a dredged area off the northern mole of Novyy basseyn, leading from the entrance to that basin to Vorontsovskaya naberezhnaya, is marked by spar buoys with appropriate topmarks. 20

Leading lights have been established for the approach channel to Taganrogskiy port. The front light is exhibited, at an elevation of 42 feet (12m8), from a white, metal, framework structure surmounted by a disc with a red stripe, situated close northward of the head of the northern mole; the rear light is exhibited, at an elevation of 59 feet (18m0), from a similar structure surmounted by a square with two red stripes, situated about  $1\frac{1}{2}$  cables northward of the front light. These lights in line, bearing  $353^{\circ}$ , lead through the dredged channel to the entrance to Novyy basseyn. 25

**Spoil ground.**—A spoil ground lies with its north-western corner about  $1\frac{1}{4}$  miles eastward of Cherepakha light-structure ( $47^{\circ} 11' N.$ ,  $39^{\circ} 57' E.$ ). 30

**Pilotage.**—Foreign merchant vessels are conducted into Taganrogskiy port by pilots during the day only. The obligation of pilotage rests with the harbourmaster.

**Taganrog. — Port facilities. — Radio station.**—The town of Taganrog, situated on the level headland of Mys Taganrog, is an important industrial centre and is also a centre of administration. The chief industries are metallurgy and tanning. There are several hospitals in the town. In 1967, the population of Taganrog was about 238,000. 35

A supply of coal is maintained, but no mechanical appliances are available for coaling. Fresh provisions are plentiful. Fresh water is laid on to the quays but the supply is restricted. 40

Repairs to hull and machinery can be undertaken. There is a patent slip in Remontnyy basseyn; for details, *see* Appendix I. There is also a small slip, available for small craft only, in Novyy basseyn. 45

There is a 40-ton floating crane in the port. A tug, equipped for fire-fighting and a large number of lighters are available.

The harbour and town are connected with the general railway system. During the season of navigation there is regular sea communication with ports in the Sea of Azov. There is regular air service with Moscow. 50

**Storm signals.**—Storm signals, *see* page 18, are displayed from a mast at the head of the Damba.

**Harbour regulations.**—Certain harbour regulations are in force for Taganrogskiy port; copies should be obtained from the harbour office.

**Life-saving.**—A life-saving station, equipped with motor lifeboats and boats fitted for work in ice, is situated near the head of the southern mole. 55

**Climatic table.**—*See* page 80.

*Chart 2234.*

**TAGANROGSKIY ZALIV.—Directions.**—From the position described on page 321, close eastward of the light-buoy moored 20½ miles westward of Dolgaya Kosa light-structure, a vessel bound for Zhdanov  
 5 should steer north-eastward for Nos. 15 and 16 light-and-bell-buoys (page 349) marking the entrance to the dredged channel 5½ miles east-north-eastward of Belosarayskiy light-structure, passing westward of the light-buoy moored 6 miles east-south-eastward of the same light-structure; when the leading light-structures for the approach  
 10 channel to Coal harbour are sighted, they should be brought into line bearing 012½°.

If bound for Taganrog, after passing the light-buoy 6 miles east-north-eastward of Belosarayskiy light-structure, a vessel should follow the fairway channel, passing southward of the obstruction about 8 miles  
 15 eastward of Belosarayskiy lighthouse, and northward of the white spar buoy surmounted by a black cone, point up, moored about 11½ miles eastward of that lighthouse, and of the spar buoys marking the sunken obstruction southward of that spar buoy, all of which are described on page 346; southward of Krivaya Kosa light-buoy and the spar buoy  
 20 moored close to it (page 361), and northward of Peschanyy light-buoy and the spar buoy moored close to it (page 362) which buoys mark the channel between the outer and inner roads of Bol'shoi Taganrogskiy reydy; southward of Beglitskiy light buoy and the spar buoy moored close to it (page 355); northward of Grecheskaya light-buoy and the spar buoy moored  
 25 close to it (page 362); southward of the red spar buoy (page 356), and of Petrushina light-buoy, and the spar buoy moored close to it (page 362), which buoys mark the fairway channel eastward of Bol'shoi Taganrogskiy reydy; and thence northward to the light-buoy marking the western side of the entrance to the approach channel to Taganrogskiy port (page 363),  
 30 when the leading beacons for that channel should be brought in line.

At night, the light-buoys are sufficient guides for the channel and the pecked track should be followed as by day.

For regulations regarding the draught of vessels using Zhadnovskiy reydy and Bol'shoi Taganrogskiy reydy, see page 361.

35 For cautions with regard to fishing vessels, see page 354, and with regard to navigational aids, see page 321.

For directions for ports on Reka Don, see page 371.

**DONSKAYA DEL'TA.—General remarks.**—Donskaya del'ta, the delta of Reka Don, which forms the head of Taganrogskiy zaliv, starts  
 40 near Gnilovskaya (Gnilovk) village, about 17 miles from the head of the gulf and about 3 miles below the town of Rostov, where Donets Mertvyi (Donets), the most northerly branch, divides from the main river. A few miles farther downstream, the large Rukav Kalancha branches off northward; thence the remainder of the main stream, which carries  
 45 about half the outflow of the river, is known as Reka Staryi Don. Rukav Kalancha divides near Ragozhkina farm, sending off Kutuyur'ma (Great Kuterma) rukav northward. Farther westward still, all the branches divide into numerous channels which enter the head of Taganrogskiy zaliv by upwards of 24 mouths. These extend from the village of Sinyavka  
 50 (47° 16' N., 39° 17' E.), situated about 2½ miles within the mouth of Donets Mertvyi, on the north, to the village of Kagal'nik, situated on the eastern side of Girlo Svinoye (Svinoe), about 12½ miles southward.

The main mouths are Girlo Perevoloka and Girlo Yegurcha (Egurcha) two mouths of Kutuyur'ma rukav about 5 miles westward of Sinyavka;  
 55 Girlo Kalancha, about 3½ miles farther southward; and Girlo Merino-

*Chart 2234.*

voye (Merinovoe) and Girlo Peschanoye (Peschanoe) of Reka Staryy Don, about  $1\frac{1}{2}$  and  $2\frac{1}{2}$  miles, respectively, southward of Girlo Kalancha.

All the mouths frequently change direction and vary in depth, and, after gales from westward, new mouths are sometimes formed. 5

Prior to 1928, shipping proceeded to Rostov by Girlo Perevoloka and Girlo Yegurcha, but these branches have now silted considerably, and the approach to Rostov is by way of Rostovskiy Morskoy kanal, *see* page 366, which leads to Girlo Peschanoye, and by Reka Staryy Don.

Girlo Merinovoye has depths of from 4 to 5 feet (1m2 to 1m5) and is 10 available for small craft.

The whole of the head of Taganrogskiy zaliv is fringed by a very shallow flat, and the numerous islands near the mouths of the delta are almost awash. The banks rise gradually farther upstream, and near Ragozhkina farm they are about 6 feet (1m8) high. Within about 4 miles 15 of the head of the gulf the islands are completely covered by dense masses of reeds, from 7 to 8 feet (2m1 to 2m4) in height.

The southern side of the delta, from the village of Kagal'nik to the town of Azov, about 5 miles eastward, rises steeply to high land, but farther inland this high land recedes southward. 20

The port of Rostov is situated on Reka Don about 27 miles, by river, from Girlo Peschanoye. The depths in this reach vary from 12 to 60 feet (3m7 to 18m3), and the width from about one to 6 cables and it is navigable throughout the season of navigation. There are a number of bars, with depths of from 12 to 13 feet (3m7 to 4m0), through which 25 channels have been dredged, but these are liable to silt at times. Except for the last 7 miles or so below Rostov ( $47^{\circ} 10' N.$ ,  $39^{\circ} 43' E.$ ), the channel is extremely sinuous and requires careful navigation.

In general, the fairway lies closer to the concave bank of the river, and flats and sand cays extend off the various points. An exception to 30 this is at Petrovskiy perekat, about 8 miles from Girlo Peschanoye, where the fairway lies close to the southern or convex bank.

Reka Don is navigable as far as Pavlovsk, about 450 miles upstream. *See* also page 6.

**Range of water level.**—The water level in the river is subject to 35 considerable seasonal changes due to the melting of the snow in the river basin, and also to the action of the wind; *see* page 343.

**Currents.**—In Girlo Peschanoye the rate of the current appears to be unaffected by the level of the water in the river. During the period between the spring freshets and the autumn drought, the mean rate 40 with easterly winds is  $2\frac{1}{2}$  knots, and the maximum rate  $4\frac{1}{2}$  knots, and with westerly winds the mean rate is from three-quarters of a knot to one knot, and the maximum rate 2 knots.

In the main channel off Rostov the strongest currents occur during the spring freshets, when they attain a rate of from 3 to 4 knots, or 45 occasionally from 4 to 5 knots. As the water level due to these freshets decreases, so does the rate of the current, and after they have ceased the average rate is about half a knot. Then, however, the rate is much affected by the direction of the wind. Easterly gales may increase the rate to  $2\frac{1}{2}$  knots, and westerly gales may reduce it to nothing or even 50 cause a current setting upstream with a rate of as much as a quarter of a knot.

**Winds.**—In the lower reaches of Reka Don the prevailing winds are south-westerly in the summer, and north-easterly during the remainder of the year. The latter winds are remarkable for their strength and 55 continuance, sometimes blowing for three or more weeks on end; they



*Chart 2234.*

are known locally as "Verkhovoy". The former winds, known locally as "Nizovka" are equally strong but of shorter duration. Winds from other quarters are rare.

- 5 **Ice.**—The average dates between which the river is closed to navigation by ice are December 7th and March 23rd. The earliest and latest recorded dates of opening are March 9th and April 9th, respectively, and the earliest and latest recorded dates of closing are November 16th and December 18th, respectively. The ice in the river attains a thickness of  
10 from about one to  $1\frac{1}{2}$  feet (0m3 to 0m5).

- Rostovskiy Morskoy kanal.** — **Navigational aids.** — Rostovskiy Morskoy (Morskoi) kanal consists of three reaches numbered westward from Ostrov Dzhulka, an island situated on the northern side of the entrance to Girlo Peschanoye. In January, 1938, this channel had a  
15 least depth of 12 feet (3m7), and a width of about 250 feet (76m7).

The third, or outermost reach, is about 14 cables in length and leads in an 084° direction; thence the second reach leads for about  $6\frac{1}{4}$  miles in an 070° direction; and thence the third reach leads for about  $6\frac{1}{4}$  miles in an 082° direction.

- 20 A light-and-bell buoy, painted white and exhibiting a *white flashing* light *every three seconds*, is moored at the southern side of the entrance to the channel, about  $4\frac{1}{2}$  miles northward of the extremity of Chimburskaya kosa (page 360).

- The channel is marked at intervals of one kilometre (about  $5\frac{1}{2}$  cables),  
25 by perches, placed in pairs on either side of the channel; each perch exhibits a *white* light. Perches on the northern side of the channel are painted red, and those on the southern side, black. Those perches at the turning points between the reaches each exhibit two *white* lights and have a buoy moored alongside them.

- 30 Leading lights have been established for the second reach. The front light is exhibited, at an elevation of 40 feet (12m2), from a sheathed wooden pyramid surmounted by a triangle, 29 feet (8m8) in height, situated on an artificial islet about  $2\frac{1}{2}$  miles north-north-eastward of the extremity of Ochakovskaya kosa (47° 02' N., 39° 06' E.) (page 360); the  
35 rear light is exhibited, at an elevation of 88 feet (26m8), from a similar structure surmounted by a ball, 73 feet (22m2) in height, situated on an artificial islet about  $1\frac{1}{2}$  miles east-north-eastward of the front light. These light-structures in line, bearing 070°, lead through the second reach.

- Leading lights have been established for the first reach. The front  
40 light is exhibited, at an elevation of 27 feet (8m2), from a black, framework shield surmounted by a triangle, point up, 25 feet (7m6) in height, situated on the southern side of Ostrov Dzhulka; the rear light is exhibited, at an elevation of 40 feet (12m2), from a similar shield surmounted by a ball, 60 feet (18m3) in height, situated about three-quarters of a mile  
45 westward of the front light. These light-structures in line, bearing 082°, lead through the first reach.

- Caution.**—In 1938, work on widening the first reach was projected, and leading beacons, to lead through the reach on completion of the work, were erected on the mainland northward of Kagal'nik village.  
50 No recent information is available (1969).

- Taganrogskoye koleno.**—**Buoyage.**—**Lights.**—Taganrogskoye (Podkhodnoi) koleno consists of a dredged channel about  $2\frac{1}{2}$  miles long and 200 feet (61m0) wide, which leads from the direction of Taganrogskiy port to join the first reach of Rostovskiy Morskoy kanal about  $5\frac{1}{2}$  miles from  
55 Girlo Peschanoye; in 1938, there were depths of 10 feet (3m0) in this channel. It is marked by perches in a similar manner to Rostovskiy

**Chart 2234.**

Morskoy kanal, and, in addition, the northern side of the seaward entrance to the channel is marked by a spar buoy, exhibiting a *red* light.

Leading lights on artificial islets have been established for Taganrogskoye koleno. The front light is exhibited, at an elevation of 24 feet (7m3), from a wooden, framework pyramid, 18 feet (5m5) in height, situated about  $2\frac{1}{2}$  miles north-eastward of the extremity of Ochakovskaya kosa; the rear light is exhibited, at an elevation of 36 feet (11m0), from a similar structure, 18 feet (5m5) in height, situated about three-quarters of a mile east-south-eastward of the front light. These light-structures in line, bearing about  $115^\circ$ , lead through Taganrogskoye koleno. 5 10

**Spoil grounds.**—Two spoil grounds are situated on the northern side of Rostovskiy Morskoy kanal, one on either side of Taganrogskoye koleno.

**Regulations for navigating in Rostovskiy Morskoy kanal and Taganrogskoye koleno.**—The following extracts have been made from the regulations dated September 20th, 1929, no later information being available in 1969:— 15

No vessel is entitled to enter the channel if her draught exceeds the depth indicated at the pilot station. 20

The draught of each vessel must be marked in feet at the stern and stern; otherwise she will not be allowed to pass into the channel.

Vessels are forbidden to overtake each other in the channel, or to pass each other at the bends. When a power-driven vessel intends to pass ahead of a power-driven vessel in tow, or a sailing vessel, she must blow her whistle indicating the side on which she will pass. An overtaking vessel must keep clear of the vessel overtaken, and must not, in any case, cross her course within a distance of about 2 cables. 25

If a vessel grounds in the channel owing to the water falling, she must immediately hoist her national flag at the foremast, and by night two *red* lights, one above the other, in a conspicuous place. 30

Vessels at anchor near the pilot station must always be ready to let go a second anchor or to weigh anchor on the demand of the Head of the Pilot-master's post.

A vessel, whose draught is greater than the depth indicated in the channel, must anchor near the pilot station. 35

Vessels lying at anchor near the pilot station must buoy the anchor with a small red buoy.

The Head of the Pilot-master's post is entitled to verify the draught of a vessel. 40

Any break in the buoyage or shoaling of the channel must be reported by the Master of a vessel to the Captain of the Port on arrival at Rostov ( $47^\circ 10' N.$ ,  $39^\circ 43' E.$ ).

Every vessel under weigh in the channel must, at all times, have a stern anchor ready to let go. 45

If several vessels, proceeding in the same direction meet another vessel proceeding in the opposite direction, they must form into line ahead whilst passing the latter.

When meeting, the vessel proceeding with the current must make a signal; the vessel proceeding against the current must reply to the signal and give way to the other. 50

During fog, thick haze, and mist, vessels are prohibited from entering the channel.

Small craft, including fishing boats, under weigh in the channel and approaching vessels proceeding in the opposite direction, or dredgers, must quit the channel, according to their draught. 55

*Chart 2234.*

Masters of vessels under weigh in the channel are strictly enjoined to keep within the buoyed limits of the channel, not to foul the buoys or displace the beacons, nor to touch the edges of the channel; these edges  
5 have a hard bottom.

**Girlo Peschanoye to Rostov.—Buoyage and beacons.**—The fairway in Reka Staryy Don and Reka Don is, for the most part, marked by perches; those on the port hand, proceeding upstream are coloured red and exhibit *red fixed* lights, and those on the starboard hand are coloured  
10 black and exhibit *white fixed* lights. The more difficult bends are marked by leading beacons, and buoys are moored alongside the perches marking the fairway. In addition, iron beacons, known as spring beacons, are placed to mark the line of the banks during floods, when the perches and buoys are liable to be carried away; they are coloured in a similar  
15 manner to the perches, and those on the port hand, proceeding upstream are each surmounted by a ball, and those on the starboard hand, by a truncated pyramid, base down.

**Pilot station.—Depth and storm signals.**—A pilot station, consisting of a two-storeyed building with a tower on its roof, is situated on  
20 the south-eastern bank of Reka Staryy Don about  $3\frac{1}{2}$  miles from Girlo Peschanoye, opposite Gosudarev farm buildings, amongst which there is a conspicuous red church. At this station there is a wharf, alongside which there are depths of from 5 to 6 feet (1m5 to 1m8).

Depth signals, *see* page 21, and storm signals, *see* page 18, are shown  
25 from a mast on this wharf.

This station is the headquarters of the Pilot-master, who is responsible for supervising the traffic in the channel, and also for the buoyage and beacons of Reka Don.

**Port Azov.—Port facilities.—Communications.**—Port Azov lies  
30 on the southern bank of Reka Staryy Don about 8 miles above Girlo Peschanoye. It is accessible to vessels drawing not more than 12 feet (3m7). There is a quay 1,575 feet (480m1) long, below which there is a wharf.

The town of Azov ( $47^{\circ} 06' N.$ ,  $39^{\circ} 25' E.$ ), with a population, in 1935,  
35 of about 25,000, is situated on rising ground southward of the port. It is the centre of local administration. There is a hospital in the town. The town is subject to malaria.

Coal can be obtained. Water is laid on to the wharf and quay. Provisions are plentiful.

40 There is regular sea communication with ports in the Sea of Azov and Black sea during the season of navigation.

The village of Kagal'nik, which is an annexe of the port, is accessible by light-draught vessels by way of Rostovskiy Morskoy kanal, Reka Staryy Don and Girlo Svinoye. The latter branch leads southward from  
45 Reka Staryy Don about  $2\frac{1}{2}$  miles within Girlo Peschanoye.

**Life-saving.**—There is a life-saving station, equipped with a power-driven lifeboat, in the port.

**Rostovskiy port.**—Rostovskiy port consists of that reach of Reka Don lying between Soyuz cement works near the village of Gnilovskaya,  
50 and a floating bridge at Nakhichevan', about  $3\frac{1}{2}$  miles farther upstream. A railway bridge ( $47^{\circ} 10' N.$ ,  $39^{\circ} 42' E.$ ), described below, crosses the river about half a mile above Soyuz cement works.

There are depths of only about 12 feet (3m7) alongside the various  
quays and piers. Owing to this and to the liability to silt of the channels  
55 of approach, the greater part of all exports from Rostov are transhipped in Bol'shoy Taganrogskiy reyd.

*Chart 2234.*

Rostovskaya naberezhnaya extends about  $1\frac{1}{2}$  miles upstream from the railway bridge along the northern bank. The river bed slopes down steeply from this quay and, in places, there are depths of 24 feet (7m3) about 70 feet (21m3) from it. Railway lines run close to the quay, and within it are the various port buildings. 5

Nakhichevanskaya naberezhnaya extends about 6 cables along the northern bank above Rostovskaya naberezhnaya.

Naberezhnaya Kovsha is situated on the southern bank. Part of this quay consists of a slip or ramp about  $1\frac{1}{2}$  cables long, and part of it is a wharf, 1,425 feet (343m0) long. There is also a camber 2,367 feet (720m0) long and about 700 feet (213m4) wide, with depths of from 8 to 12 feet (2m4 to 3m7). 10

**Pilots.**—There are no regular pilots at Rostov, but in case of necessity the Superintendent of the pilot station at Gosudarev, *see* page 368, will pilot a vessel. 15

**Port regulations.**—Special port regulations are in force every year. Copies of these regulations may be obtained from the Port Office.

Vessels of every description are forbidden to anchor in the reaches of the river, the canals, or dredged channels. 20

**Bridges.—Prohibited anchorage.—Regulations.—Signals.**—The railway bridge, and also the two floating bridges which cross the river within the limits of the port, form considerable obstructions to river traffic. 25

The railway bridge has a movable span which is opened at fixed times throughout the 24 hours, and also at other times when necessary, provided that railway traffic is not interfered with. Owing to the curve of the river, passage through the bridge is sometimes very difficult, particularly when the river is in flood or if it is blowing fresh.

Vessels waiting to pass through the bridge are prohibited from anchoring within an area on each side of the bridge. These areas are marked by beacons, from which lights are exhibited at night, on each bank both below and above the bridge. 30

The following extracts are taken from the regulations for the passage of vessels through the railway and floating bridges at Rostovskiy port:— 35

By day, when the railway bridge is closed, vessels proceeding down the river must pass through the span on the right bank, and vessels proceeding up the river must pass through the span on the left bank.

All large and small vessels, without exception, are allowed to pass through the railway bridge by day. 40

At night, which may be considered to be the period from sunset to sunrise, vessels are only allowed to pass through the movable span, whether the bridge is open or not. The following order for passing will be observed: first, the largest vessels proceeding down-stream, then small vessels, then, in the same order, vessels proceeding upstream. 45

Power-driven vessels wishing to pass through the railway bridge at night, must exhibit all the regulation navigation lights. When approaching the bridge and wishing to pass with the span open, the vessel will sound 5 short blasts on the whistle; and when approaching the movable span when it is closed—4 short blasts on the whistle, signifying "I request permission to pass through". After the signal from the bridge by the illuminated cone, signifying "Passage is permitted," the vessel will sound one long and two short blasts signifying "I am about to pass under the bridge through the movable span", or "I am proceeding through the open span." 50 55

Tugs, with one or two vessels in tow, will follow the same procedure.

*Chart 2234.*

If the opening of the bridge is delayed, or if the bridge, being already open, is suddenly closed for the passage of trains, the bridge will again be opened for the vessels waiting to pass, after the trains have passed.

- 5 Vessels proceeding down river will be allowed to pass first, then vessels proceeding up river; power-driven vessels have precedence over sailing vessels.

Vessels passing through a bridge are forbidden to overtake each other, and the distance between vessels proceeding in the same direction should  
10 be not less than from about one to 2 cables.

A vessel wishing to pass through a floating bridge will sound one short and one long blast on the whistle, signifying "I request that the floating bridge may be opened".

- A vessel proceeding through the opening of a floating bridge will  
15 sound one long and one short blast on her whistle, signifying "I am about to pass through the open part of the bridge." These blasts will be sounded after the requisite signal has been shown on the mast of the floating bridge.

*Signals regulating the passage of vessels through the movable span of the  
20 railway and floating bridges.*

The traffic of vessels is regulated by the following signals, shown at the yard of the signal mast on the movable part of the railway bridge and at the yard of the mast on the floating bridge.

- A black cylinder signifies that preparations are being made to open  
25 the bridge. It will be displayed from 5 to 10 minutes before the bridge is opened.

A black cylinder hoisted and lowered three times signifies that the bridge will be opened shortly, but that the opening is being delayed for some unknown reason.

- 30 The absence of a black cylinder on the signal mast indicates that the bridge will not be opened for the passage of vessels for some time. At night the black cylinder will be replaced by a *green* light on the mast, which signifies that the bridge will be opened in 5 to 10 minutes. A treble flash of the light will indicate that the bridge will be opened, but  
35 the opening is being delayed, and the absence of a *green* light, that it will not be opened.

A black cone, point up, displayed at the yard of the mast, signifies that vessels may pass through the open part of the bridge up-stream, into port. On this signal being displayed, vessels proceeding down-  
40 stream must slow down, stop, or make fast temporarily alongside the quay.

A black cone, point down, signifies that vessels may pass through the open part of the bridge down-stream. On this signal being displayed, vessels proceeding up-stream must give way and leave a clear passage,  
45 anchoring or waiting on one side.

A black ball signifies that the passage is closed to vessels.

Three *red* lights arranged in the form of a triangle, point down, and visible on both sides, signify that vessels coming out of the port down river may pass without hindrance.

- 50 Three *red* and three *white* lights signify that the passage through the open part of the bridge is closed to all vessels, whether proceeding down or up river.

The day and night signal will be shown at the moment a vessel signals a request for the bridge to be opened, or when about to be opened.

- 55 Vessels about to pass through the open part of the bridges, when not nearer to the bridges than from about 110 to 220 yards (100m to 200m),

*Chart 2234.*

must sound a number of short blasts on the whistle, in order to attract the attention of the signalman on the bridge.

When the proper signal is shown on the signal mast, vessels must sound the requisite number of blasts on the whistle. 5

**Rostov.**—The city of Rostov ( $46^{\circ} 10' N.$ ,  $39^{\circ} 43' E.$ ) is a large industrial centre, and is the administrative centre of the province. It is one of the largest towns on the southern coast of the U.S.S.R.; in 1967, the population, including that of Nakhichevan<sup>1</sup> was about 737,000. It is the centre for the produce of all the rich territory of the basin of Reka Don and other large districts in the neighbourhood. There is a hospital in the city. 10

The principal industries include the manufacture of metals and agricultural machinery, tobacco, cement, timber, dairy products, and canned provisions. 15

The chief exports are grain, coal, and timber, and the chief imports are salt and iron building materials.

**Port facilities.**—A large stock of coal is maintained. Fresh water is laid on to the quays. In summer, water from Reka Don is unfit for drinking. Fresh provisions are plentiful. 20

Repairs to vessels can be undertaken. There are two floating cranes of 50 tons and 15 tons capacity, respectively, two travelling cranes and various mechanical loading appliances.

There are two patent slips, for details of the larger, *see* Appendix I.

A few tugs are available. 25

**Communications.**—Rostov is connected with the general railway system. During the season of navigation there is regular sea communication with ports in the Sea of Azov and Black sea. There is air service with Moscow, Baku, Tbilisi (Tiflis), Sochi, and elsewhere.

There is a radio station at Rostov, *see* page 26. 30

**Depth signals.**—**Storm signals.**—Depth signals, expressed in centimetres, are displayed in figures on a notice board on a wooden framework, about 14 feet (4m3) high, situated on Rostovskaya naberezhnaya ( $46^{\circ} 10' N.$ ,  $39^{\circ} 43' E.$ ).

Storm signals, *see* page 18, are shown from a mast near the entrance to the camber. 35

**Directions.**—Vessels bound for ports on Reka Don, after passing the spar buoy marking the southern extremity of the flat off Petrushina kosa (page 355), should shape course for the light-buoy marking the southern side of the entrance to Rostovskiy Morskoy kanal, and proceed by that channel, described on page 366. 40

Vessels from Taganrogskiy port can proceed by way of Taganrogskoye koleno, described on page 366.

## CHAPTER X

NORTH-EASTERN SHORE OF THE BLACK SEA: KERCHENSKIY  
PROLIV TO BATUMI

*Charts 2214, 2235, 2236.*

**CAUCASIAN COAST.**—**General remarks.**—**Aspect.**—The Caucasian coast, from Mys Zheleznyy-Rog ( $45^{\circ} 06' N.$ ,  $36^{\circ} 47' E.$ ) to the Turkish-U.S.S.R. boundary (page 446), has a length of about 320 miles.  
5 Its general trend for about the first 250 miles is south-easterly, and thence, for the last 70 miles, southerly.

The southern coast of Tamanskiy poluostrov, from Mys Zheleznyy-Rog to Bugazskoye girlo, the old mouth of Reka Kuban' about  $6\frac{1}{2}$  miles eastward, is moderately high and bold; thence to Anapa, about 21 miles  
10 south-eastward, it is low and sandy.

From Anapa to Mys Idokopas ( $44^{\circ} 25' N.$ ,  $38^{\circ} 13' E.$ ), about 49 miles south-eastward, about 14 miles east-south-eastward, the coast is backed by sheer, lofty cliffs remarkable for their white colour. Within these cliffs the mountains rise in an almost continuous wall, intersected by a number  
15 of valleys and ravines.

The white cliffs continue along the greater part of the coast between Mys Idokopas and Mys Konstantinovskiy (Konstantin), about 98 miles south-eastward, but the mountains within them are less uniform in outline and elevation, becoming gradually lower towards Mys  
20 Konstantinovskiy.

Within the coast between Mys Konstantinovskiy and Mys Kodor, about 60 miles farther south-eastward, there is a lofty and almost unbroken range of mountains. This range approaches the coast near Gagry (Gagri), about 14 miles east-south-eastward of Mys Konstantinovskiy and thence  
25 recedes inland, and the remainder of this stretch of coast is low and wooded.

A narrow shingle beach extends along the whole of the cliffy parts of this coast.

For about 70 miles south-eastward of Mys Kodor an extensive wooded  
30 plain lies within the coast, the only notable eminence being Gora Olen' (Olyen), described on page 373. Abreast this plain, the coast is sandy.

The Caucasian range lies parallel with, and a short distance within the coast. Those mountains in this range which form the best landmarks are described below; they are most clearly seen from dawn until the sun rises  
35 above them.

Gora Tkhachegochuk ( $44^{\circ} 31' N.$ ,  $38^{\circ} 18' E.$ ) rises to a conical summit, 2,585 feet (787m) high, about  $6\frac{1}{2}$  miles north-north-eastward of Mys Idokopas. It is visible from close inshore on all bearings and is particularly prominent from southward. This mountain is separated by a saddle from  
40 an otherwise unbroken range which extends north-westward; it is but little higher than the neighbouring summits, some of which resemble it in shape.

*Chart 2235.*

Gora Gebeus (Bigius), 2,408 feet (734m) high, lies about 16 miles  
45 east-south-eastward of Gora Tkhachegochuk; it has several peaks and a tooth-like projection on its summit.

*Chart 2235.*

Gora Lysaya (Luisaya), 2,687 feet (819m0) high, lies about 18 miles south-eastward of Gora Gebeus and is very prominent. When seen from west-north-westward, it appears to have two summits, the eastern of which is the higher, but from south-westward or south-eastward it appears as a truncated cone with a broad base. *See view [40].* 5

Gora Boz-Tepe, 3,054 feet (930m8) high, rises on the western side of Dolina Psezuapse, about 23 miles south-eastward of Gora Lysaya, and is also very prominent. When seen from north-westward or southward it appears to have two summits, the northern being the higher, but from south-westward, it appears conical. 10

Gora Zhemsi, 3,622 feet (1,104m0) high, lies about 6½ miles south-eastward of Gora Boz-Tepe. From westward, its summit appears as a sharp, conical peak, rising from a high and moderately level ridge, but from south-westward, the summit appears more blunt with a cleft in it. 15 From south-eastward, it appears conical with a rounded top in which there is a sharp cleft. *See view [42].*

Gora Chura, 7,350 feet (2,240m3) high, lies about 23 miles east-south-eastward of Gora Zhemsi. When seen from south-westward its summit appears rounded, with two deep dips on its southern side and two small projections on its northern side. 20

Gora Shugus, 10,640 feet (3,243m1) high, lies about 9 miles eastward of Gora Chura. This mountain is the highest of the prominent peaks rising within the north-eastern shore of the Black sea. It has a sharply-pointed and jagged summit which is covered with perpetual snow. 25

Gora Khukhup, 2,170 feet (661m4) high, lies about 10½ miles north-westward of Mys Konstantinovskiy (43° 24' N., 39° 58' E.). Although its elevation is comparatively small, this mountain stands out on account of its rounded outline and dark colouring, and is one of the best marks on this coast. 30

Gora Bytkh (Buitkh), about 2 miles north-westward of Gora Khukhup is similar in appearance to that mountain but only 980 feet (298m7) high; from a distance, it can only be distinguished when approaching from north-westward, as from other directions it merges with Gora Khukhup, but from close inshore, both summits are clear and appear pointed. 35

Gora Tseferbeya-Shapka or Pilav-Tepesi, 6,270 feet (1,911m1) high, lies about 33 miles east-south-eastward of Mys Konstantinovskiy; its summit is rounded and resembles a Caucasian highlanders' cap. This mountain can only be seen when south-westward of Mys Souk-Su (Suksu), from which direction it shows over the coastal range. 40

*Chart 2236.*

Gora Olen' (Olyen) (42° 24' N., 41° 50' E.), 1,529 feet (466m0) high, lies about 42 miles south-eastward of Mys Kodor. It is cut by a large ravine and is remarkable on account of its isolated position in the plain. There are a few hills near this mountain. 45

*Charts 2235, 2236.*

Along the whole of the coast from Anapa to Mys Kodor there are many indentations which afford more or less secure anchorage, but in general, except in the four ports of Novorossiysk, Tuapse, Poti and Batumi, where vessels can obtain shelter from winds from seaward, the north-eastern shore of the Black sea is devoid of safe anchorages. 50

**Winds.**—On the Caucasian coast in autumn and winter the most frequent winds are north-easterly or easterly. When such winds are strong, severe squalls sweep down to the coast.

At Novorossiysk, especially from September to March the bora (burya) (page 58) occasionally blows, sometimes with hurricane strength; *see* 55



**Charts 2235, 2236.**

page 385. When there is a depression over the eastern part of the Black sea and high pressure over the land northward and north-eastward, conditions favour its development. In late spring and summer, winds from between

- 5 south-east and south-west are frequent, especially in the afternoon.

See also pages 53–59.

**Charts 2216, 2245.**

**MYS ZHELEZNY-ROG TO SUDZHUKSKAYA KOSA.**—*Mys Zheleznyy-Rog to Anapski mys.*—Coast.—From Mys Zheleznyy-Rog,

- 10 (45° 07' N., 36° 44' E.), page 301, the coast of Tamanskiy poluostrov trends eastward for about 5 miles to Ozero Sochenoye, a salt lake close within the coast, where it terminates in reddish cliffs. Thence the coast trends south-eastward for about 22 miles to Anapskiy mys and is very low and sandy. Within this stretch of coast there are a number of detached hills,
- 15 the most prominent of which are Gora Lis'ya (Polivadinia), 426 feet (129m8) high, and Gora Lysaya (Lisaya), 350 feet (106m7) high, situated about 8½ and 10 miles, respectively, eastward of Mys Zheleznyy-Rog. The summit of Gora Lysaya is sharply pointed while that of Gora Lis'ya is flatter. The coastal hills become less prominent as Anapskiy mys is approached.

- 20 The north-western part of this very low, sandy stretch consists of two narrow spits, which separate the shallow Kiziltashskiy liman from the Black sea, and between which, about 2 miles eastward of Ozero Sochenoye, is Bugazskoye (Bugaz) girlo, the narrow mouth of Reka Kuban'. Bugazskiy coastguard station stands on the western of these spits. The eastern spit
- 25 is known as Blagoveshchenskaya kosa from a village of this name situated on it about 10 miles eastward of Bugazskoye girlo. Farther south-eastward the coast becomes higher with many small hills close within it.

- The lower reaches of Reka Kuban' flow for about 400 miles through flat steppe country before forming a large delta containing several lagoons
- 30 and discharging into the Sea of Azov; see page 335. Formerly the main branch of this river entered the Black sea by Bugazskoye girlo (45° 06' N., 36° 55' E.) and formed within it the large Kiziltashskiy liman and two smaller lagoons, named Tsokur liman and Vitzyaevskiy liman. This branch is now drying up and little remains of the two smaller lagoons. Reka Kuban'
- 35 is in flood three times during the year; in spring; in summer, due to the melting of snow; and in autumn, due to the rains.

**Dangers**—**Buoyage**—The dangers off Mys Zheleznyy-Rog are described on page 301.

- Banka Mariya Magdalina, having two heads, 6 cables apart, with depths
- 40 of 4 and 15 feet (1m2 and 4m6) over them, lies 11 miles east-south-eastward of Mys Zheleznyy-Rog and 1½ miles offshore. A light-buoy, painted black and white in stripes and exhibiting a *white flashing* light, is moored between the two heads of the shoal, about 8 cables south-westward of the shoaler head. Mys Zheleznyy-Rog in line with Mys Panagiya (page 303) leads
- 45 southward of this shoal.

A detached 26-foot (7m9) patch lies 2 miles westward of Banka Mariya Magdalina.

- Anchorage.**—Anchorage can be obtained, in depths of 45 feet (13m7), mud, off Bugazskiy coastguard station, or, during fine weather
- 50 and offshore winds, in depths of from 30 to 36 feet (9m1 to 11m0), mud, about three-quarters of a mile offshore abreast the coastguard station. The depths shoal regularly to the shore, but the coast is so shelving that landing is difficult.

- Anapskiy reydy.**—**Aspect.**—**Light.**—Anapskiy reydy is entered on the
- 55 northern side of Anapskiy mys, a headland which extends about 1½ miles

*Charts 2216, 2245.*

from the general line of the coast and terminates in three small spurs, which project, respectively, westward, north-westward and northward. The walled town of Anapa, which was formerly fortified, stands on the headland.

Anapskiy mys is flat-topped and faced by steep, white cliffs about 200 feet (61m0) high, which continue south-eastward and rise to lofty hills extending inland in an easterly direction. This stretch of white cliffs makes the point easy of identification.

On the southern and western sides of the point the town walls rise from the cliffs, but on the northern side, the land slopes down towards the roadstead. Southward of the town there are numerous windmills. About half a mile eastward of the north-western extremity of Anapskiy mys is a church with a high belfry which is prominent and makes a good landmark.

A mole extends in a northerly direction from the northern extremity of Anapskiy mys. On its eastern side, between its head and a slight elbow about midway along it, there is a berthing space about 300 feet (91m4) long, with depths alongside of from 10 to 12 feet (3m0 to 3m7). This mole provides good shelter from all westerly winds, but north-easterly winds, which frequently blow hard, make unpleasant conditions for vessels berthed alongside.

Anapskiy light (44° 53' N., 37° 18' E.) is exhibited, at an elevation of 144 feet (43m9), from a black, truncated, pyramidal structure with a lantern gallery, 66 feet (20m1) in height, adjoining a two-storeyed dwelling, situated on the cliff about 3 cables south-south-eastward of the western extremity of Anapskiy mys.

**Dangers.—Buoys.**—Anapskiy mys is fringed by a rocky flat, with depths of less than 30 feet (9m1), which extends up to 4 cables northward and north-westward and 2 cables westward from it. On this flat there are depths of less than 6 feet (1m8) as much as 1½ cables offshore and there is a patch, with a least depth of 7 feet (2m1) over it, about 3½ cables north-north-eastward of the north-western extremity of the point.

The western edge of this flat is marked by a black and white spar buoy surmounted by two black cones, bases together, and its northern and north-eastern edges by two white spar buoys each surmounted by a black cone.

A rock with a depth of 26 feet (7m9) over it, and an obstruction with a depth of 15 feet (4m6) over it, the positions of which are approximate, lie, respectively, about 9 cables north-north-westward, and 1½ miles north-north-eastward of Anapskiy light-structure.

**Prohibited anchorage.**—Anchoring and fishing are prohibited in an area which extends about 4½ miles from the coast with its centre about 4½ miles north-westward of Anapskiy light-structure.

**Lights.—Anchorages.**—Leading lights have been established for anchorage in Anapskiy reyd. The front light is exhibited, at an elevation of 14 feet (4m3) from a metal framework structure supporting a white rectangular wooden daymark with a black central stripe, 26 feet (7m9) in height, situated in the north-eastern part of the town, about 1½ miles north-eastward of Anapskiy light-structure: the rear light is exhibited at an elevation of 47 feet (14m3) from a similar structure, 36 feet (11m0) in height, about 2½ cables east-south-eastward of the front light-structure; in line these lights bear 098°.

Leading lights have been established for approaching the mole. The front light is exhibited from a white mast surmounted by a black, framework triangle, point down, 26 feet (7m9) in height, situated on the elbow of the mole; the rear light is exhibited from a similar structure surmounted by a

*Charts 2216, 2245.*

black, framework triangle, point up, situated about one cable southward of the front light. These lights in line, bearing about 182°, lead from the leading line of the anchorage to the mole. The front light is liable to be  
 5 obscured by vessels lying alongside the mole.

Anchorage can be obtained, in depths of 36 feet (11m0), mud and sand, on or near the outer leading line. This berth is near the intersection of the two leading lines; it is exposed to winds from between south-south-west and north-west, and vessels should proceed to sea immediately  
 10 if the wind sets in from seaward with signs of approaching bad weather.

Small craft can obtain anchorage, with shelter from south-westerly winds, in depths of about 12 feet (3m7), south-eastward of the 7-foot (2m1) patch, somewhat protected by this danger. Such vessels, with local knowledge, can approach this anchorage by the channel southward of  
 15 the 7-foot (2m1) patch, in which there are depths of 15 feet (4m6), or by passing northward and eastward of it. During the summer season a bar of sand is formed off the mouth of Rechka Anapa, which flows into the road about half a mile eastward of the mole; this vicinity should, therefore, be approached with caution.

20 The nature of the bottom in the roadstead is very varied, being, in places, sand with patches of rock.

**Anapa.—Port facilities.—Storm signals.**—In 1938, the population of Anapa (44° 53' N., 37° 19' E.) was about 15,000, but this number is largely increased in summer by visitors. There is a hospital in the town.

25 The principal exports are wine, bricks, grain and cotton; imports are coal, flour and general merchandise.

Fresh provisions can be obtained. Fresh water is laid on to the mole but the supply is not always available.

There is a 2-ton crane on the mole.

30 Storm signals, *see* page 18, are shown from a mast on the mole.

There is regular sea communication with Crimean and Caucasian ports.

**Anapskiy mys to Sudzhukskaya kosa.—Dangers.—Navigational aids.—Anchorages.**—From Anapskiy mys (44° 53' N., 37° 19' E.) the coast trends south-eastward for about 7½ miles to the mouth of Reka Sukko,  
 35 which flows through Ushchel'ye Khinderey. The white cliffs, described on page 375, become lower towards the mouth of that river. This stretch of coast is fringed by a continuation of the rocky flat off Anapskiy mys which becomes more narrow southward and disappears near the mouth of Reka Sukko. Thence the coast trends southward for about 1½ miles to  
 40 Ostrov Utrish and is steep-to, with depths of 18 fathoms (32m9), mud and sand, about three-quarters of a mile offshore.

Some distance within, and dominating Ostrov Utrish, there is a high dark-coloured hill which is visible from a considerable distance westward; it is steep and wooded and has a white precipice on its seaward side.

45 Southward of Ushchel'ye Khinderey there is a wide, wooded valley, between which and the ravine the white cliffs continue but are lower than those northward.

Ostrov Utrish (44° 45' N., 37° 23' E.), the western extremity of which extends about 6 cables from the general line of the coast at the foot of the hills dominating it, is not truly an island as it is joined to the mainland  
 50 by a narrow isthmus; the isthmus has, however, been almost washed away and only a narrow, rocky ridge remains. The point itself is somewhat elevated and, from close inshore, appears as an islet.

The peninsula is fringed by a bank which, with depths of less than  
 55 30 feet (9m1) over it, extends about 6 cables northward, 2 cables westward, and 5 cables southward from it. There is a 10-foot (3m0) patch on this

*Charts 2216, 2245.*

bank about  $2\frac{1}{2}$  cables northward of Ostrov Utrish, and a number of detached shoals, with depths of from 14 to 30 feet ( $4\text{m}3$  to  $9\text{m}1$ ), lie off the entrance to a cove southward of the isthmus.

Utrish light is exhibited, at an elevation of 50 feet ( $15\text{m}2$ ), from a white hexagonal concrete tower 20 feet ( $6\text{m}1$ ) in height, situated on the western extremity of Mys Utrish. *See* Appendix III.

Small craft can obtain anchorage in depths of from 30 to 36 feet ( $9\text{m}1$  to  $11\text{m}0$ ), with shelter from southerly winds, in a cove northward of the isthmus, or from northerly winds, off a cove southward of it; the coastal bank is steep-to. There is a small wooden pier at the head of each of these coves; small, light-draught craft can berth alongside these piers.

From Ostrov Utrish the coast trends south-eastward for about  $4\frac{1}{2}$  miles to Mys Utrishenok, a point which, from close inshore, resembles Ostrov Utrish. The white cliffs continue along this stretch of coast but are lower than those northward.

From a position on the coast about 2 miles south-eastward of Ostrov Utrish to Mys Utrishenok the coast is fringed by a bank which extends about three-quarters of a mile off the former position, with depths of 27 to 29 feet ( $8\text{m}2$  to  $8\text{m}8$ ), and about one mile off Mys Utrishenok, with depths of 32 feet ( $9\text{m}8$ ) over it, near its outer edge.

A light-buoy, painted black and white and exhibiting a *white flashing* light, marks the edge of the coastal bank one mile south-westward of Mys Utrishenok.

*Chart 2245.*

From Mys Utrishenok the coast trends east-south-eastward for about 12 miles to Mys Myskhako. For the first 5 miles to Dyurso reka the land within the coast rises from whitish cliffs, intersected by narrow valleys, to conical mountains. Between Dyurso reka and the fertile Dolina Ozereyk (Ozerzik), about 3 miles eastward, the white cliffs are somewhat higher. Dolina Ozereyk is the widest valley on the whole stretch of coast between Anapskiy mys and Novorossiyskaya bukhta and may be easily identified; a river flows through the valley and the village of Yuzhnaya Ozereika is situated near its mouth. Thence to Mys Myskhako the land within the coast rises from low, greyish-coloured cliffs to the mountains.

Ozereika light is exhibited on the coast a quarter of a mile eastward of the mouth of Dolina Ozereyk ( $44^{\circ} 40' N.$ ,  $37^{\circ} 38' E.$ ).

There are several shoals, with depths of 36 feet ( $11\text{m}0$ ) and less, about  $3\frac{1}{2}$  miles east-south-eastward of Mys Utrishenok and as much as about one mile offshore.

Anchorage may be obtained, in depths of from 24 to 48 feet ( $7\text{m}3$  to  $14\text{m}6$ ), mud and sand, and good holding ground, from one to  $1\frac{1}{2}$  cables off the mouth of Dolina Ozereyk. This anchorage is sheltered from west-north-west, through north, to east-south-east, and communication with the shore here is possible at times when strong north-easterly winds, *see* page 385, prevent vessels from entering Novorossiyskaya bukhta. A 10-foot ( $3\text{m}0$ ) rocky shoal lies close off the western entrance point of the river.

Mys Myskhako rises to a summit, Gora Myskhako, 1,476 feet ( $449\text{m}9$ ) high, one mile northward and, on a close approach, appears bare; this mountain is very prominent from southward and south-westward owing to a large, grey triangular cliff on it. *See* view [33].

From Mys Myskhako the coast trends east-north-eastward for about  $3\frac{1}{2}$  miles to Sudzhukskaya kosa. Rechka Myskhako flows into the sea about one mile eastward of Mys Myskhako; there is a large factory near its mouth. Farther eastward, the cliffs gradually become lower.

*Chart 2245.*

From an offing the high land within Mys Myskhako, between Dolina Ozereyk and Novorossiyskaya bukhta, appears as an island.

*Chart 162.*

- 5 **NOVOROSSIYSKAYA BUKHTA.—General remarks.—Aspect.**—Novorossiyskaya bukhta is entered between Sudzhukskaya kosa ( $44^{\circ} 40' N.$ ,  $37^{\circ} 48' E.$ ) and Mys Doob, about  $4\frac{1}{2}$  miles south-eastward, and extends in a north-westerly direction for about 4 miles to its head which fronts the valley of Rechka Tsemes, a river which dries in summer.

10 *Charts 162, 2245.*

The north-eastern side of the bay is backed by Varada range, an unbroken line of mountains several peaks of which exceed 2,000 feet (607m) in elevation and which extends south-eastward as far as Gelendzhik, *see* page 387. The spurs of this range terminate at the shore of the bay in sheer, white, triangular-shaped cliffs. The summit of the range is bare but the slopes are covered with small trees.

- 15 Gora Doob rises to an elevation of 1,483 feet (452m) nearly 2 miles east-south-eastward of Mys Doob. When seen from north-westward or south-eastward, Gora Doob appears to have two summits but from other directions it appears rounded. Although much lower than Varada range, its dark colour and the fact that it is separated from that range by a deep valley, render it a very prominent mark.

The whole of the western shore of the bay and also its head, is fronted by a low, pebble beach and is rocky in places.

- 25 Vessels approaching Novorossiyskaya bukhta from westward will first sight Gora Gebeus and Gora Tkachegochuk, described on page 372, then Varada range, and finally Gora Doob, which last is the best mark for making the bay from any direction.

- The town of Novorossiysk is situated on the western shore near the head of the bay and Novorossiyskiy port lies at its head.

**Port Limits.**—The water area of the port comprises the inner roadstead, within the limits of the protecting moles; and the outer roadstead, within the limits of those moles, the meridian passing through Penayskiy front light (page 380) and the parallel of Lat.  $44^{\circ} 39' N.$

35 *Chart 162.*

**Coast.—Dangers.—Navigational aids.**—Sudzhukskaya kosa (*see* above) is a low spit about three-quarters of a mile long and difficult to distinguish. It encloses Ozero Solënnoye, a shallow lagoon, which is connected with the sea by a narrow passage about 4 cables westward of the south-eastern extremity of the spit.

- 40 Sudzhukskiy rif, with depths of less than 36 feet (11m), extends  $1\frac{1}{2}$  miles south-south-eastward from the south-eastern extremity of Sudzhukskaya kosa. Ostrov Sudzhuk, a low islet composed of shingle, lies on this reef  $3\frac{1}{2}$  cables southward of Sudzhukskaya kosa, to which it is connected by the remains of a masonry mole; there are some grey buildings on the islet. There is considerable foul ground surrounding this islet and this, with rocks having depths of less than 6 feet (1m8) over them, extends  $3\frac{1}{2}$  cables south-south-eastward of the islet. Depths of 10 and 13 feet (3m0 and 4m0) lie  $4\frac{1}{2}$  cables south-eastward and 5 cables south-south-eastward of Ostrov Sudzhuk, and there is a detached 17-foot (5m2) patch  $6\frac{1}{2}$  cables south-eastward of the islet.

- 50 Sudzhukskiy light is exhibited, at an elevation of 39 feet (11m9), from a white round concrete tower on a grey concrete base, 37 feet (11m3) in height and fitted with a radar reflector, situated  $7\frac{1}{2}$  cables south-eastward of Ostrov Sudzhuk. A fog signal is sounded from the light-structure.

*Chart 162.*

Mys Doob, the south-eastern entrance point of the bay, rises to Gora Doob ( $44^{\circ} 37' N.$ ,  $37^{\circ} 57' E.$ ), described on page 378, and terminates in white cliffs which extend south-eastward along the coast from it. Doobskiy light is exhibited, at an elevation of 344 feet (104m8), from a white octagonal tower, 92 feet (28m0) in height, situated about 4½ cables south-south-eastward of the extremity of Mys Doob. *See view [34].* During northerly winds this light is frequently obscured by mist. A radiobeacon transmits and a fog signal is sounded from the lighthouse. *See Appendix III.*

Two obstructions exist in the entrance to Novorossiyskaya bukhta,  $2\frac{1}{2}$  and  $3\frac{1}{2}$  miles, respectively, westward of Mys Doob.

*Charts 162, 2245.*

**Prohibited anchorage.**—Anchoring and fishing are prohibited in the approaches to Novorossiyskaya bukhta within an area, indicated on the charts, which extends about 12 miles westward and 4 miles south-south-eastward from Mys Doob, and also extends to the eastern shore of the bay about  $1\frac{1}{2}$  miles north-westward of Mys Penay (*see below*).

*Chart 162.*

**Spoil ground.**—A spoil ground extends about 4 cables south-westward from the shore between positions 8 and 13 cables south-eastward of Mys Doob.

**Western and eastern shores of Novorossiyskaya bukhta.**—

**Dangers.**—**Navigation aids.**—**Prohibited area.**—**Prohibited anchorage.**—**Western side.**—Mys Lyubvi ( $44^{\circ} 42' N.$ ,  $37^{\circ} 47' E.$ ), a point on the western shore of the bay, lies  $2\frac{1}{2}$  miles north-north-westward of Ostrov Sudzhuk. This shore is fringed by a bank which, with depths of 36 feet (11m0) and less over it, extends up to  $3\frac{1}{2}$  cables offshore in places.

A light is exhibited, at an elevation of 65 feet (19m8) from a pink-coloured building, 49 feet (14m9) in height, situated about  $1\frac{1}{2}$  cables south-south-westward of Mys Lyubvi.

An area prohibited to navigation, indicated on the chart, extends eastward from Mys Lyubvi. The eastern limit of this area is marked by a conical light-buoy, painted red and white in stripes and exhibiting a *red flashing light every two-and-a-half seconds*, moored 6 cables eastward of the light-structure.

Four fish-factory piers extend from the shore about 9 cables southward of Mys Lyubvi.

**Eastern side.**—On the eastern side of the bay, Rechka Doob, a small, shallow stream, flows through the valley between Gora Doob and Varada range and into the head of a small bight, entered northward of Mys Doob. Kabardinka village, a small seaside resort with a population of about 1,400 in 1938, lies near the mouth of Rechka Doob. A bank, with depths of less than 36 feet (11m0) over it, extends about half a mile off the shores of this bight; a rocky patch with depths of less than 6 feet (1m8) lies on this bank 6 cables northward of Kabardinskiye front leading light-structure (page 380). Half a mile north-north-eastward of this light-structure there is a small jetty, 121 feet (36m9) long, with a depth of  $8\frac{1}{2}$  feet (2m6) at its head. An obstruction, with a depth of one foot (0m3) over it, lies close to the head of the jetty. A mooring buoy lies  $8\frac{1}{2}$  cables westward of the jetty.

The north-eastern shore of the bay is fringed by a bank which, with depths of less than 36 feet (11m0), extends in places about  $2\frac{1}{2}$  cables offshore. Mys Penay and Mys Sheskharis project a short distance south-westward from the general shore line of this side of the bay, about 3 miles north-north-westward, and  $5\frac{1}{2}$  miles north-westward, respectively, of

**Chart 162.**

Mys Doob. Mys Penay is not easy to distinguish from south-westward, but it may be identified by Penayskiy front leading light-structure, *see* below, which stands on a small, low, whitish cliff rising from it, with  
 5 higher triangular-shaped cliffs of the same colour on either side.

**Penayskiye banki.—Navigational aids.**—Penayskiye banki, with general depths of less than 60 feet (18m3) over it and on which there are several shoal rocky patches, lies close within the middle of the entrance to Novorossiyskaya bukhta. On the western side of this bank there is a  
 10 shoal with a least depth of 26 feet (7m9) over it, marked on its western side by a light-buoy, painted black and white in stripes, fitted with a radar reflector and exhibiting a *white flashing light every two and a half seconds*, moored 11½ cables eastward of Sudzhukskiy light-structure.

A 21-foot (6m4) patch, marked on its northern side by a red and white  
 15 spar buoy surmounted by a cross over a ball, lies on the northern part of the bank, 9 cables west-south-westward of Mys Penay (44° 40' N., 37° 52' E.). There is a 36-foot (11m0) rocky patch 2 cables north-westward of the spar buoy.

A shoal, with depths of 25 feet (7m6) over it and with a least depth of  
 20 16 feet (4m9), lies on the eastern part of the bank with its shoalest part situated about 1½ miles south-south-westward of Mys Penay; a detached 19-foot (5m8) rocky patch lies near the eastern edge of the bank about 2½ cables east-north-eastward of the 16-foot (4m9) shoal.

A light-buoy, painted red and white in stripes and exhibiting a *red flashing*  
 25 *light every two-and-a-half seconds*, is moored one mile southward of Mys Penay and marks the eastern extremity of the bank.

Southward of Penayskiye banki, and between the bank and Mys Doob, there are several detached rocky patches with depths of from 49 to 52 feet (14m9 to 15m8) over them, whose positions may be seen on the chart.

30 A detached 46-foot (14m0) rocky patch lies 5½ cables westward of Mys Penay.

Leading light-beacons stand on Mys Penay. The front light is exhibited at an elevation of 108 feet (32m9), from a four-sided metal tower carrying a white rectangular daymark with a red stripe, 66 feet (20m1) in height,  
 35 situated on the extremity of Mys Penay; the rear light is exhibited, at an elevation of 193 feet (58m8), from a similar structure 37 feet (11m3) in height, situated about 2½ cables northward of the front structure; in line, bearing 002°, these light-beacons lead into Novorossiyskaya bukhta, passing eastward of Penayskiye banki. *See Appendix III.*

40 From the vicinity of Penayskiye banki the approach to Novorossiyskiy port is marked by two sets of leading lights, one set on either side of the bank. Kabardinskiye leading lights, marking the channel which lies north-eastward of the bank, are situated near the head of the bight which lies eastward of Mys Doob; three lights form this alignment and all are exhibited from four-sided metal framework structures with white square  
 45 wooden daymarks facing the lead: the front, centre, and rear of these lights have elevations of 47, 139, and 296 feet (14m3, 42m4, and 90m2). In line, astern, bearing 130°, the lights lead from the alignment of the Mys Penay light-beacons towards the entrance to Port Novorossiysk.

50 The western set of leading lights also lead towards the harbour entrance to the Port. The front leading light is formed by Novorossiyskiy light-structure on the head of Vostochnyy mol, and is described below: the rear light is exhibited from a white tower with a red stripe, situated 1½ miles north-westward of the front structure; in line, bearing 334½°,  
 55 they lead westward of Penayskiye banki. An auxiliary light is exhibited from the rear light-structure during poor visibility by day.

*Chart 162.***Northern part of Novorossiyskaya bukhta.—Navigational aids.—**

The entrance to Novorossiyskiy port lies between the heads of Vostochnyy mol and Zapadnyy mol about one mile south-eastward if the head of the bay. Vostochnyy mol extends about 4 cables in a south-westerly direction from the north-eastern shore of the bay, about 2 miles north-westward of Mys Sheskharris, and Zapadnyy mol extends about 6 cables in a north-easterly direction from the south-western shore abreast the town of Novorossiysk. 5

Novorossiyskiy light, which is also the front of a pair of leading lights referred to above, is exhibited, at an elevation of 43 feet (13m1), from a white, round, metal tower, 35 feet (10m7) in height, situated on the head of Vostochnyy mol. A fog signal is sounded from the head of the mole. 10

A light is exhibited, at an elevation of 27 feet (8m2), from a red metal tower, 22 feet (6m7) in height, situated on the head of Zapadnyy mol. This light is not exhibited during strong north-easterly winds. 15

For a description of the lights within the harbour, *see* page 383.

Blizhniy Tsemesskiy beacon (44° 44' N., 37° 48' E.) consisting of a white, stone, truncated pyramid, 28 feet (8m5) in height, is situated at an elevation of 392 feet (119m5) about one mile northward of Novorossiyskiy light. 20

Tsemesskiy beacon is not easy to distinguish from the entrance to the bay on account of a quarry which is situated behind it; also, during south-easterly or north-easterly winds it is obscured by smoke from the chimneys of the cement works. 25

**Gavan' Sheskharris.—Lights.**—Gavan' Sheskharris (44° 42' N., 37° 50' E.) is situated close southward of Mys Sheskharris. The harbour is contained between a mole on the south and a pier on the north, both of which extend westward for about 3½ cables from the quay which forms the eastern side of the harbour. Close westward of the root of the pier is allocated as a fire-fighting berth. 30

A light is exhibited, at an elevation of 49 feet (14m9) from a white, round, metal column, 41 feet (12m5) in height, on the head of the south mole.

A light is exhibited, at an elevation of 29 feet (8m8), from a white, metal framework tower on a concrete base, 13 feet (4m0) in height, situated at the head of the northern pier. 35

A light is exhibited, at an elevation of 29 feet (8m8) from a white column on a concrete base, 13 feet (4m0) in height, at the root of the pier.

A light is exhibited, at an elevation of 18 feet (5m5) from a white metal framework tower on a concrete base, 12 feet (3m7) in height, at the fire-fighting berth. 40

There are depths of about 15 feet (4m6) alongside the quay.

Anchoring or fishing is prohibited in an area extending about 7 cables westward from the head of the mole and pier.

**Spoil ground.—Mooring buoys.**—A spoil ground is situated in the north-eastern corner of Novorossiyskaya bukhta, 1½ miles north-westward of Mys Sheskharris. Two mooring buoys are laid near the eastern side of the area. 45

**Anchorage.—Buoyage.—Caution.**—The anchorage in the northern part of the bay eastward of the town of Novorossiysk is considered dangerous during the autumn and winter months on account of the north-easterly winds which then prevail, *see* page 385. 50

Vessels may not anchor within the inner harbour, except with special permission.

An area where vessels must anchor on arrival is situated south-westward of Mys Sheskharris (44° 42' N., 37° 50' E.). An anchorage area for non- 55



**Chart 162.**

degaussed vessels is established with its centre about  $1\frac{1}{2}$  miles south-south-westward of Mys Sheskhari.

A mooring buoy is situated 12 cables westward of Mys Sheskhari.

- 5 Anchorage can also be obtained in the bight northward of Mys Doob. The best berth is in depths of from 12 to 13 fathoms (21m9 to 23m8), stiff mud, about one mile northward of Mys Doob.

The nature of the bottom in Novorossiyskaya bukhta is mainly mud, with mud and sand in places. The only rocky area is in the passage  
10 between Mys Penay and Penayskiye banki, and anchorage should not be attempted in this area.

Should the wind freshen from north-eastward, or should No. 3 storm signal, *see* page 19, be displayed at the signal station near the root of the western mole, vessels lying in the outer roadstead are advised to put  
15 to sea or to take shelter off the mouth of Dolina Ozereyk, *see* page 377.

**Currents.**—The current in the approaches to Novorossiyskaya bukhta flows north-westward in a band about 30 miles wide, at a rate of about half a knot, but there may be a drift current to the south-eastward at the same rate.

- 20 **Pilotage.**—Pilotage is compulsory. The pilot usually boards vessels about  $1\frac{1}{2}$  miles westward of Doobskiy light ( $44^{\circ} 37' N.$ ,  $37^{\circ} 54' E.$ ). Within the port, movements of vessels are carried out under the guidance of a pilot and with the assistance of tugs, the necessity and number of which is decided by the pilot; the pilots are very competent.

- 25 **Regulations.**—The following extracts are taken from the Port Regulations, in force in 1963. Copies of the latest regulations should be obtained from the Port Authority:

1. Vessels approaching the port must inform the Captain of the Port on departure from previous port and again 48 hours beforehand of their  
30 expected time of arrival at the anchorage and request the services of a pilot at the same time. The anchorage for vessels awaiting a pilot is situated at the southern end of the arrival anchorage described above. Two hours before arrival at the anchorage the vessel must signal the exact time of arrival.

- 35 3. By day, vessels entering the bay or within the limits of the port should display their national flags. At night, vessels lying in the outer road must exhibit a stern light; when alongside the piers or quays they must exhibit a light at the gangways in addition to the regulation lights.

5. Vessels entering harbour must give way to vessels leaving harbour.

- 40 6. At least 4 hours notice must be given to Port Authority before shifting berth or leaving the harbour.

8. When within the Port limits vessels must proceed at minimum speed.

13. No vessel is permitted to enter or leave the port unless she has at least one foot (0m3) of water under her keel at low water.

- 45 14. Vessels moving within the limits of the port must not lower their anchors into the water.

Vessels under weigh in the harbour must always have an anchor ready to let go.

37. Vessels must not anchor in the fairway or in areas marked on the  
50 charts where anchorage is prohibited.

*Charts 2245, 162.*

- Directions.**—A vessel entering Novorossiyskaya bukhta is recommended to make for a position 7 miles south-westward of Doobskiy light-structure, and from this position to steer for the light-structure  
55 bearing  $045^{\circ}$ .

A vessel proceeding to one of the anchorage areas in Novorossiyskaya

*Charts 2245, 162.*

bukhta should, when about  $1\frac{1}{2}$  miles from Doobskiy light-structure, bring the leading light-structures on Mys Penay into line, bearing  $002^\circ$ , and adhere to this alignment, passing eastward of Penayskiye banki. When Kabardinskiye leading light-structures come into line the vessel should alter course north-westward, keeping the light-structures in line, astern, bearing  $130^\circ$ . When Penayskiye banki has been passed, course may be altered for the anchorage. 5

A vessel proceeding direct to Port Novorossiysk should, when about  $1\frac{1}{2}$  miles south-westward of Doobskiy light-structure, alter course north-north-westward. Novorossiyskiy light-structure and the light-structure  $1\frac{1}{2}$  miles north-north-westward should be brought into line, bearing  $334\frac{1}{2}^\circ$ , and the vessel should steer on this alignment until close to the harbour entrance, passing westward of Penayskiye banki; until the light-structures can be identified the vessel should be guided by the light-buoy marking the western side of Penayskiye banki and by Sudzhukskiy light-beacon, passing about midway between them, but taking care to keep at least  $1\frac{1}{2}$  cables westward of the light-buoy and at least  $2\frac{1}{2}$  cables eastward of the light-beacon. Blizhniy Tsemesskiy beacon, bearing  $339^\circ$ , just clears the western side of Penayskiye banki. 10 15 20

*Chart 162.*

**Novorossiyskiy port.**—**Quayage.**—**Depths.**—**Lights.**—Novorossiyskiy port ( $44^\circ 43' N.$ ,  $37^\circ 47' E.$ ) is the best equipped harbour on the Caucasian coast but was badly damaged during the 1939–45 war; as a result, several foul areas and obstructions, some of which are indicated on the chart, still exist within the harbour. 25

Large vessels can berth alongside the wharves, and the harbour never freezes.

The entrance to the harbour lies between the heads of Zapadnyy mol and Vostochnyy mol, *see* page 381, and is about 2 cables wide with a least depth of 42 feet (12m8). The port buildings and establishments are situated in the valley of Rechka Tseme, within the head of the bay. 30

On the south-western side of the harbour, about 2 cables within, and parallel with Zapadnyy mol, is Kabotazhnyy (Coasting) mol, which is about 2 cables long, and has depths of 17 to 18 feet (5m2 to 5m5) alongside its southern side and about 23 feet (7m0) on its northern side. A cement factory stands on the mole. 35

A light is exhibited, at an elevation of 21 feet (6m4), from a white concrete column, 15 feet (4m6) in height, on the head of Kabotazhnyy mol.

In the north-western corner of the harbour at the mouth of Rechka Tseme, is the Cold Storage basin. 40

The Timber wharf, about 1,500 feet (457m2) long, with depths alongside of from 22 to 28 feet (6m7 to 8m5), forms the north-eastern side of the basin. The Naval base is situated at the north-western end of this quay. Lights are exhibited at elevations of 21 feet (6m4) from white, round, metal posts, 13 feet (4m0) in height, situated on the north-eastern and south-western corners, respectively, of the head of the Timber wharf. 45

A number of wharves or piers project from the north-western side of the harbour. An oiling pier (No. 5), with deep-water berths on both sides of it, lies one cable north-north-eastward of the Timber wharf, with another oil pier (No. 4) about the same distance farther north-eastward. One large tanker can berth alongside the south-western side of the latter oil pier, and load at a rate of about 1,000 tons per hour. A spherical buoy, painted red and white in stripes, is moored close off the end of No. 4 pier, which was in ruins in 1966. A pier (No. 3), on which stands a grain conveyor, lies about one cable north-eastward of No. 4 oil pier; two 50 55

*Chart 162.*

large vessels can berth along its south-western sides. Shirokiy pirs, 800 feet (243m8) wide, projects  $3\frac{1}{2}$  cables from the shore, one cable north-eastward of No. 3 pier, and has depths of about 36 feet (11m0) alongside  
5 its south-western side and 32 feet (9m8) on its north-eastern side.

Lights are exhibited from white metal columns, 13 or 14 feet (4m0 or 4m3) in height, on the outer corners of each of these piers.

On the eastern side of the harbour, a quay extends  $2\frac{1}{2}$  cables northward from the root of Vostochnyy mol; a 15-foot (4m6) patch lies nearly one  
10 cable from its northern end. From the northern end of this quay the Cement pier extends about one cable south-westward and one cable farther west-north-westward is the Import pier, an L-shaped pier which extends  $2\frac{1}{2}$  cables south-south-westward from the shore. The Cement pier has depths of about 29 feet (8m8) near its head; the Import pier has  
15 depths of about 36 feet (11m0) on its south-eastern side, and 30 feet (9m1) on its north-western side.

There are two mooring buoys between the head of the Cement pier and Vostochnyy mol.

A light is exhibited from a concrete structure, 20 feet (6m1) in height,  
20 on the north-western end of the head of the Cement pier. Lights are exhibited on the south-eastern end of the head, and on the north-western corner, of the Import pier.

**Foul areas. — Works. — Caution. — Prohibited area.** — Numerous wrecks lie in an area, indicated on the chart, in the north-eastern part of  
25 the harbour. In 1966, works were in progress in this area on the construction of Shirokiy pirs, No. 2 extending about  $4\frac{1}{2}$  cables south-south-eastward from the shore,  $1\frac{1}{2}$  cables north-eastward of Shirokiy pirs.

Some obstructions, over which the depths are indicated on the chart, lie in the harbour and vessels must exercise caution.

30 Navigation is prohibited within the area, indicated on the chart, in the south-eastern corner of the harbour.

**Novorossiysk** — The town of Novorossiysk ( $44^{\circ} 44' N.$ ,  $37^{\circ} 47' E.$ ) is of great commercial and industrial importance; in 1967, the population was about 120,000. The town consists of three parts, of which Novorossiysk  
35 is situated on the slopes about one mile south-westward of the harbour; the suburb of Standart, which is the business quarter, on the northern side of the harbour; and the suburb of Krasnotsementnik', near the cement works on the eastern side of the harbour. There are several hospitals in the town; and an International Seamen's Club with  
40 the usual amenities.

The principal industries are cement, slates, oil-refining and viniculture. The main exports are grain, petroleum, timber, cement and chilled foods.

Stocks of coal are maintained. Coal can be supplied alongside by transporter or is available from lighters.

45 Diesel oil can be obtained.

Fresh provisions are plentiful. Fresh water is available.

Repairs to medium size vessels and machinery can be executed.

In 1968, two tugs were used for berthing and unberthing. There are three or four floating cranes, the largest with a lifting capacity of about  
50 250 tons. There are about 7 cranes on the Import pier with capacities of from 3 to 45 tons; general cargo is handled on this pier and is discharged direct into railway wagons, there being no storage space.

Two floating docks of about 18,000 and 5,000 tons capacity, respectively, are moored in the south-eastern corner of the port, and there is a patent slip-  
55 way for small craft. Salvage equipment is available.

There is a branch office of the Black Sea Hydrographic department in

*Chart 162.*

the town, from which information with regard to pilotage in the Black sea can be obtained.

**De-ratting.**—De-ratting can be carried out; *see* page 27.

**Communications.**—Most of the wharves and piers are connected with general railway system. There is frequent sea communication with the other Black Sea ports. 5

There is a radio station, *see* page 26, at Novorossiysk ( $44^{\circ} 44' N.$ ,  $37^{\circ} 47' E.$ ).

**Signal station.**—**Storm signals.**—There is a signal station at which constant watch is kept, on the head of No. 3 pier. 10

Storm signals, *see* page 18, are shown from a mast at the signal station.

**Climatic table.**—*See* page 81.

**Winds.**—This locality is particularly liable to strong north-easterly winds which occasionally reach gale, and even hurricane force and are known as 'Bora' (or 'Burya'). These winds are most frequent in the months September to March. From about November to March they are commonly associated with temperatures below freezing. The violence of the wind causes very high seas and whips up large quantities of freezing spray. This quickly forms a thick coating of ice on vessels and has caused small craft to founder. 15 20

When a Bora is expected vessels at anchor are advised to secure all gear on deck and put to sea as, even with two anchors down and using the engines, they are liable to be blown ashore.

A Bora gives warning of its approach by small whitish clouds forming and then massing on the summits of Varada range, and continues until these clouds disperse and disappear. The direction of this wind shifts frequently, with violent squalls, from between north-north-east and east-north-east; these variations are more marked in the bight northward of Mys Doob. 25 30

Whilst a Bora is blowing, entry into the bay is impracticable and should not be attempted. Entry, though difficult, is possible during fresh north-easterly winds.

*Chart 2245.*

**MYS DOOB TO MYS KODOSH.**—**Mys Doob to Mys Tonkiy.**—**Coast.**—From Mys Doob ( $44^{\circ} 38' N.$ ,  $37^{\circ} 55' E.$ ) to Bukhta Rybaikaya, a small bight about  $4\frac{1}{2}$  miles south-eastward, the coast consists of spurs from Gora Doob which terminates in whitish cliffs. 35

A beacon stands, at an elevation of 459 feet (139m9), half a mile north-north-westward of the northern entrance point of Bukhta Rybaikaya. 40

The entrance to Bukhta Rybaikaya is about 4 cables wide, and the bight extends about  $2\frac{1}{2}$  cables inland. Its eastern and western sides are fringed by banks with depths of less than 18 feet (5m5). There are depths of 36 feet (11m0) in the middle of the entrance, decreasing regularly to the head of the bight. 45

The whitish cliffs terminate at Bukhta Rybaikaya and between this bight and Mys Tonkiy, about 2 miles east-south-eastward, the coast is sloping. The whole stretch of coast between Mys Doob and Mys Tonkiy, except off Bukhta Rybaikaya is steep-to; in depths of over 24 feet (7m3) the bottom is sand and mud, and in lesser depths, sand and rock. 50

**Bukhta Gelendzhikskaya.**—**Aspect.**—Bukhta Gelendzhitskaya is entered between Mys Tonkiy and Mys Tolstyy about one mile south-eastward. Mys Tonkiy is low and sandy and may be identified by its unbroken, whitish colour and by a group of buildings on it; it is, however, difficult to distinguish from westward or south-westward, as from these 55

*Chart 2245.*

directions it merges with the eastern side of the bay, which is also whitish in colour. Mys Tolstyy is also whitish in colour, but is higher and bolder than Mys Tonkiy.

- 5 The western side of the bay for about one mile northward of Mys Tonkiy, is flat and rocky and slopes gradually to the shore, terminating in a low cliff about 13 feet (4m0) high. Thence the northern and eastern shores are low and covered with dense forest which rises gradually in sloping spurs to Varada range. The southern shore is cliffy from Mys  
10 Tolstyy for about one mile eastward, whence a sandy beach extends to the south-eastern corner of the bay, where the town of Gelendzhik stands at the mouth of a deep valley.

The best marks for making Bukhta Gelendzhikskaya are Gora Doob, described on page 378, and Gora Tkhachegochuk, described on page 372.

- 15 **Dangers.—Navigational aids.**—Gelendzhikskiy light is exhibited, at an elevation of 52 feet (15m8), from a square, stone tower, painted white with a red vertical stripe, 20 feet (6m1) in height, adjoining a two-storeyed dwelling, situated on the north-eastern shore of the bay about 1½ miles north-north-eastward of Mys Tolstyy. Despite its red stripe, the light-  
20 house is not easy to distinguish from an ordinary dwelling.

Mys Tolstyy light is exhibited, at an elevation of 92 feet (28m0), from a white, round concrete tower, 41 feet (12m5) in height, situated on the point of that name (44° 33' N., 38° 03' E.).

- A white, truncated pyramidal, stone beacon, 28 feet (8m5) in height,  
25 stands at an elevation of 150 feet (45m7), on the slope of a hill about three-quarters of a mile north-eastward of Gelendzhikskiy lighthouse.

- A rocky bank, with depths of less than 18 feet (5m5), fringes Mys Tonkiy and extends from one to 2½ cables offshore; a red spar buoy surmounted by a cone, point down, is moored off the southern extremity of this bank,  
30 about 2½ cables southward of Mys Tonkiy, and a red and white spar buoy surmounted by two cones, points together, is moored off its eastern extremity, about 7 cables north-eastward of the same point.

- Mys Tolstyy is fringed by a bank which, with depths of less than 30 feet (9m1), extends as much as 3½ cables west-south-westward from it.  
35 A 2½-fathom (4m1) patch lies close within the western extremity of this bank, and a detached 21-foot (6m4) patch lies about 4 cables westward of Mys Tolstyy; a black and white spar buoy surmounted by two cones, bases together, is moored on the western side of the 21-foot (6m4) patch, and it is covered by a *red* sector of Gelendzhikskiy light between the bearings  
40 of 039° and 045°. Another patch, with a least depth of 10 feet (3m0), lies about 2½ cables southward of Mys Tolstyy, and two small patches, with depths of 12 and 10 feet (3m7 and 3m0), respectively, over them, lie about 1½ cables offshore, about three-quarters of a mile, and one mile, respectively, south-eastward of the same point.

- 45 The shores of the bay are fringed by a shelving, sandy bank with depths of less than 18 feet (5m5) over it, which extends up to about 4 cables offshore in the northern part of the bay and about 3½ cables offshore in its south-eastern corner, where there is a depth of 1½ feet (0m5) about 1½ cables offshore.

- 50 **Piers.—Light.**—There are two piers near the south-eastern corner of the bay. The northern pier is 220 feet (67m1) long, with depths of 6 feet (1m8) at its head, and of 3 feet (0m9), midway along it. There is a one-ton crane on this pier. The southern pier is 330 feet (100m6) long, with depths of 9 feet (2m7) at its head, and of 7 feet (2m1) at the end of its  
55 widened part.

A light is exhibited, at an elevation of 15 feet (4m6), from a wooden

**Chart 2245.**

post, 15 feet (4m6) in height, situated on the head of the southern pier.

At the head of the bay near Gelendzhikskiy lighthouse (44° 35' N., 38° 05' E.) there are the foundations of a pier, unfinished in 1966, consisting of three large dolphins. The outermost dolphin lies about one cable offshore, with depths of 21 feet (6m4) alongside it, and has a mooring bollard on it. 5

A pier, partly in ruins, extends about one cable from the northern shore of the bay near a disused cement works. There was, in 1938, a depth of 21 feet (6m4) at its head, gradually shoaling towards the shore. See 10  
Caution concerning Tyagun on page 393.

**Anchorage.—Directions.**—Anchorage can be obtained, in depths of 31 feet (9m4), in the south-eastern corner of the bay, with the head of the southern pier bearing between 095° and 115° and Mys Tolstyy bearing 227°. 15

The bay is exposed to winds from south-west to north-west, and winds from seaward send in a heavy sea.

By day, vessels should approach with Gelendzhikskiy lighthouse bearing 049½° and in line with the beacon situated about three-quarters of a mile north-eastward of it, which will lead through the entrance in 20  
the middle of the fairway.

At night, vessels entering the bay should keep in the *green* sector of Gelendzhikskiy light, between the bearings of 045° and 052°.

**Current.**—In normal summer weather, or during southerly winds, a moderately strong current sets north-westward across the entrance to the bay. Vessels entering under such conditions, should borrow a little on 25  
the south-eastern side of the fairway.

**Gelendzhik.—Life-saving.**—The town of Gelendzhik is a favourite summer resort. There is a hospital in the town. In 1938, the population was about 6,500, but this number is greatly increased in summer. 30

There is regular sea communication with Novorossiysk and Tuapse.

There is a life-saving station equipped with a lifeboat, situated close to the southern pier at Gelendzhik.

**Mys Tolstyy to Dzhubgskaya bukhta.—Lights.—Anchorages.**—From Mys Tolstyy (44° 33' N., 38° 03' E.) the coast trends south-eastward for about 4½ miles to the mouth of Reka Mezyb, which flows into a small bight through the wide Dolina Mezyb. From an offing the bight appears to be of considerable extent, and Dolina Mezyb is known as Fal'shivyy or False Gelendzhik as, in thick weather, it bears some resemblance to Bukhta Gelendzhikskaya. The coast between these two places can be 40  
easily identified, as it is composed of a line of sheer, white cliffs, having the appearance of a wall. The upper parts of these cliffs consist of a series of rounded segments, separated by streams, forming a regular pattern; these segments are higher in the centre of the stretch, and become narrower and lower towards either end of it. 45

From the mouth of Reka Mezyb the coast trends south-eastward for about 6 miles to Mys Idokopas, and is composed of cliffs which at first are white and irregular, but later become greyish and triangular. See views [35], [36]. These cliffs are intersected by two large, wooded gorges, through which flow Reka Khopitsay and Reka Dzhankot. On the cliff 50  
between these two rivers, there is a very prominent light-yellow patch in the form of an arch. There is a flat-topped, vertical cliff a short distance northward of the mouth of Reka Dzhankot.

Dzhankhot beacon, a four-sided open framework metal structure with a black rectangular daymark, 46 feet (14m0) in height, stands at an elevation 55

*Chart 2245.*

of 1,068 feet (325m5) on a hill about 2 miles north-westward of the mouth of Reka Dzhankhot, 3½ miles north-westward if Mys Idokopas.

Between Mys Tolstyy and Mys Idokopas there are depths of 12 fathoms  
5 (21m9), sand and mud, about one mile offshore; in depths of less than 30 feet (9m1) the bottom is sand and small stones.

*Charts 2245, 2246.*

Mys Idokopas projects south-westward from the general line of the coast and slopes gently down to the sea. This cape is steep-to, there  
10 being depths of 30 feet (9m1) from half a cable to 1½ cables offshore.

A light is exhibited, at an elevation of 113 feet (34m4), from a metal framework structure, 23 feet (7m0) in height, situated on Mys Idokopas.

From Mys Idokopas the coast trends east-south-eastward for about 8 miles to Mys Chugovkopas (44° 22' N., 38° 24' E.). At first it is composed of cliffs of similar elevation to those north-westward, but thence  
15 the cliffs become lower and then rise in three lofty segments on the western side of the mouth of Ushchel'ye Chankhot, about 3 miles eastward of Mys Idokopas. Thence to the low coast at the mouth of Dolina Pshad about 2½ miles farther east-south-eastward, the cliffs become lower and  
20 darker in colour, becoming reddish a short distance westward of Dolina Pshad. See view [36] and Appendix III.

The western side of Dolina Pshad rises to a rounded hill, and its eastern side rises to a hill which terminates in a grey-coloured cliff. This valley can be identified by a broad, light-yellow, shingle beach at its mouth,  
25 through which flows Pshada reka.

Between Dolina Pshad and Mys Chugovkopas the cliffs become darker and are intersected by a number of small gullies. Mys Chugovkopas is similar to Mys Idokopas.

Anchorage can be obtained off the mouth of Dolina Pshad, in a depth  
30 of 12 fathoms (21m9), mud and sand, with the southern extremity of the land in the vicinity of Mys Chugovkopas bearing 100°.

From Mys Chugovkopas the coast trends eastward for about 6 miles to the mouth of Reka Vulcan and continues to be cliffy. For the first mile, to Ushchel'ye Beta, the cliffs are of even elevation, but thence they are  
35 irregular in outline and are intersected by numerous gorges.

Reka Vulcan can be identified by Gora Gebeus, described on page 372, about 5 miles east-north-eastward of its mouth. The village of Arkhipo-Osipovka lies about half a mile inland in Dolina Vulcan. The mouth of Reka Vulcan is about half a cable wide and is, at times, practicable for  
40 lighters. Small craft entering the river should borrow on the western bank as far as the narrows and thence follow the eastern bank to a small and well-sheltered bight.

A light is exhibited about 2 cables westward of the mouth of Reka Vulcan.

Anchorage can be obtained abreast the mouth of Reka Vulcan, in a  
45 depth of 15 fathoms (27m4), mud and shells; closer inshore, the bottom is sand and shells. The depths decrease gradually towards the shore which is steep-to, there being depths of 30 feet (9m1) about 3 cables off it. See view [37].

From the mouth of Reka Vulcan the coast trends east-south-eastward  
50 for about 8 miles to the mouth of Reka Dzhubga, and continues cliffy with a number of deep gullies and gorges. At first the cliffs are quite bare, but farther eastward they are covered with bushes. This stretch of coast is intersected by Ushchel'ye Inal and Ushchel'ye Bzhid, two gorges about 4½ and 6 miles, respectively, from the mouth of Reka Vulcan; the former  
55 can be identified by a small point rising to a hill on the eastern side of its mouth; the latter has a high, steep cliff on either side, between which there

*Charts 2245, 2246.*

is a third, low cliff. A bank, with depths of less than 18 feet (5m5) over it, extends half a mile west-south-westward from a small point at the mouth of Ushchel'ye Inal. Dzhubgskiy light (*see below*) is obscured over this bank.

**Dzhubgskaya bukhta.—Lights.—Dangers.—Buoys.**—This is a small bight off which anchorage can be obtained; Reka Dzhubga flows into the head of the bight through Dolina Dzhubga, a wide valley which is rendered prominent by a dense wood of tall oak trees growing close to the coast. Dzhubgskiy coastguard station stands at the entrance to a ravine about half a mile eastward of the mouth of Reka Dzhubga and on the western side of the mouth of that river is a white resthouse.

Dzhubgskiy light (44° 18' N., 38° 42' E.) is exhibited, at an elevation of 37 feet (11m3), from a white, circular hut on a masonry base, 11 feet (3m4) in height, situated on the eastern side of Dzhubgskaya bukhta, about 5½ cables east-south-eastward of the mouth of Reka Dzhubga.

A pier, about 100 feet (30m5) in length and the head of which is marked by a light-structure, is situated about 1½ cables north-north-eastward of Dzhubgskiy light-structure.

The rocky coastal bank, with depths of less than 18 feet (5m5) over it and several detached shoals outlying it, extends up to 2½ cables offshore in the bay; depths of 12 and 14 feet (3m7 and 4m3) lie close within the outer edge of the bank, nearly 2½ cables south-westward of the pier, and are marked by a black and white spar buoy surmounted by two cones, bases together, and by a red spar buoy, surmounted by a cone point down, respectively. A detached 17-foot (5m2) patch lies nearly 2 cables south-south-westward of Dzhubgskiy light-structure.

**Anchorage.**—The usual anchorage is in a depth of 66 feet (20m1) about three-quarters of a mile offshore, abreast the centre of Dzhubgskaya bukhta. Close inshore, the depths decrease rapidly.

**Dzhubga.**—The village of Dzhubga is situated in Dolina Dzhubga about three-quarters of a mile inland. The chief export is lumber. There is a hospital near the lighthouse. In 1938 the population was about 600.

There is regular sea communication with U.S.S.R. Black sea ports.

**Fog.**—During the period from September to November, inclusive, Dolina Dzhubga is frequently enveloped in thick fog.

**Dzhubgskaya bukhta to Mys Kodosh.—Dangers.—Anchorages.**—Between Dzhubgskaya bukhta and Mys Kodosh, about 19 miles south-eastward, there are three small bights or coves abreast the mouths of gorges, off which anchorage can be obtained. Tenginskaya bukhtochka, the northernmost of these bights, is entered between Mys Shapsukho, a wooded point about 200 feet (61m0) high, situated about 1½ miles east-south-eastward of Dzhubgskiy lighthouse, and a low wooded point about 1½ miles farther east-south-eastward. Mys Shapsukho terminates in a grey-coloured landslip on the eastern side of which Reka Shapsukho flows down Tenginskaya dolina and enters the bight. *See view [38].*

Two rocks with depths of less than 6 feet (1m8) over them, and surrounded by depths of from 30 to 36 feet (9m1 to 11m0), lie close together about 2½ cables offshore about half a mile west-south-westward of Mys Shapsukho (44° 18' N., 38° 45' E.). Rocky reefs extend about 2½ cables off each of the entrance points of the bight, and the whole of its shore is fringed by a gradually shoaling rocky ledge, the inner part of which is nearly awash in places. Dzhubgskiy light is obscured over these dangers.

Anchorage can be obtained in depths of from 30 to 36 feet (9m1 to 11m0). At from 6 to 7 cables offshore, the bottom is sand and rock. The best berth is midway between the entrance points. Vessels entering the



*Charts 2245, 2246.*

bight should give both entrance points a berth of at least half a mile and should sound continuously. Gora Lysaya, described on page 373, is a good mark for making the anchorage.

5 *Chart 2246.*

From the eastern entrance point of Tenginskaya bukhotchka the coast trends south-eastward for about 4 miles to Mys Guavga and consist of low, bold cliffs, covered with forest; Mys Guavga is also bold and covered with trees. Except for the first three-quarters of a mile these cliffs are  
10 fronted by a narrow, sandy beach. This whole stretch of coast is fringed by foul ground which extends about 2 cables offshore, and Mys Guavga is fringed by a reef which extends about  $2\frac{1}{2}$  cables westward, and  $1\frac{1}{2}$  cables southward from it.

In fine weather, temporary anchorage can be obtained from about 5 to  
15 6 cables off the coast between Tenginskaya bukhotchka and Mys Guavga.

Bukhotchka Mikhaylovskaya, a small cove, indents the coast between Mys Guavga and Mys Beskrovnogo, about 8 cables south-eastward. Reka Nechepsukho flows through Dolina Nechepsukho between two tree-covered hills into the northern corner of the cove. A reef extends  
20 about  $1\frac{1}{2}$  cables from Mys Beskrovnogo and protects the south-eastern part of the cove, which is much frequented by fishing craft during south-westerly winds.

Anchorage can be obtained in Bukhotchka Mikhaylovskaya, in depths of from 21 to 24 feet (6m4 to 7m3), mud and sand, from about 3 to 4 cables  
25 offshore. Vessels approaching this anchorage should not close the land until the whole of Dolina Nechepsukho is well open, when they may shape course midway between the entrance points and sound continuously. Although the holding ground in the cove is good and the bottom even, the anchorage space is restricted and open to westerly and south-westerly  
30 winds.

From Mys Beskrovnogo the coast trends south-eastward for about  $2\frac{1}{2}$  miles to Mys Tu and is high and covered with forest. This stretch of coast is fringed by reefs and should be given a berth of at least half a mile. Landing can only be effected abreast the mouth of Ushchel'ye Rubstova,  
35 a gully about three-quarters of a mile south-eastward of Mys Beskrovnogo.

Mys Tu ( $44^{\circ} 12' N.$ ,  $38^{\circ} 52' E.$ ) is formed by a spur from Gora Tu, and terminates in cliffs from 55 to 70 feet (16m8 to 23m1) high. Gora Tu, the summit of which stands about 6 cables north-north-eastward of Mys Tu, is a small, dark-coloured hill, 820 feet (249m9) high, which  
40 presents a conical appearance from all directions. *See* views [39] and [40].

Bukhotchka Ol'ginskaya is entered between Mys Tu and Mys Gryaznova, about 6 cables south-eastward. Mys Gryaznova is only from 20 to 30 feet (6m1 to 9m1) high and is covered partly with forest and partly with orchards. Except just within its entrance points, the shores of Bukhotchka  
45 Ol'ginskaya are low and sloping. Reka Tu flows through a valley between forest-clad hills and into the bight near Mys Gryaznova. A reef extends about one cable westward and south-westward from Mys Gryaznova. The depths within the bight are very irregular, over sand, stones, rock and pebbles, with several 7-foot (2m1) shoals, and it should not be entered  
50 without local knowledge.

Vessels calling at Bukhotchka Ol'ginskaya usually anchor off the entrance, in depths of from 36 to 42 feet (11m0 to 12m8), sand; but *see* 'Prohibited anchorages' below.

Between Mys Gryaznova and Mys Kodosh, about  $8\frac{1}{2}$  miles south-eastward, the coast forms a slight bight, the shores of which are backed  
55 by wooded hills and intersected by several gorges or gullies. Views [40],

*Chart 2246.*

[41]. For the first 4 miles to the mouth of Ushchel'ye Kazachiy, where there is a sandy beach, there is a succession of dark-coloured cliffs cut by gullies. The distinctive Ushchel'ye Nebug, at the mouth of which stands Nebugskiy coastguard station, lies about  $1\frac{1}{2}$  miles south-eastward of Ushchel'ye Kazachiy, and is flanked by dark-coloured cliffs. Some distance up this gorge, a red, iron bridge with two spans crosses Reka Nebug and is visible from seaward. Ushchel'ye Agoy, the most prominent of these gorges and the nearest to Mys Kodosh, being about  $2\frac{1}{2}$  miles northward of that cape, is fronted by a low beach. There is a prominent cliff on the southern side of this gorge, on which the lower, rocky stratum is divided by a straight line from the upper, sandy one. Between Ushchel'ye Agoy and Mys Kodosh there is a prominent, small, white patch at the foot of a low, flat-topped cliff; this patch is divided by a belt of trees which, from an offing, resembles a black, central, vertical stripe.

The whole stretch of coast between Mys Gryaznova and Mys Kodosh is steep-to, with depths of 60 feet (18m3), sand, about one mile offshore, and of from 15 to 24 fathoms (27m4 to 43m9), mud and sand, from 2 to 3 miles offshore.

*Charts 2246, 2247.*

**Prohibited anchorages.**—Anchoring and trawling are prohibited within an area, indicated on the chart, extending about  $2\frac{1}{2}$  miles south-westward and 4 miles west-north-westward from Mys Gryaznova.

Anchoring and trawling are also prohibited within an area, indicated on the chart, which extends about 4 miles southward and 3 miles westward from Mys Kodosh.

*Chart 2247, plan of Port Tuapse.*

**BUKHTA TUAPSE AND PORT TUAPSE.**—**Danger.**—**Navigational aids.**—Bukhta Tuapse is entered between Mys Kodosh ( $44^{\circ} 05' N.$ ,  $39^{\circ} 02' E.$ ) and the coast about 3 miles south-eastward. The port and town of Tuapse are situated at the head of the bay, about  $1\frac{1}{2}$  miles eastward of Mys Kodosh. Mys Kodosh, a bluff headland, covered with dense forest and terminating in reddish-coloured, rocky cliffs, projects about one mile south-westward from the general line of the coast; it rises north-eastward to Gora Dzhiblyuk, a hill which has three peaks but is not easy to identify. The headland stands out well when seen from north-westward or south-eastward.

Kodoshskiy light is exhibited at an elevation of 62 metres from a white, octagonal tower 9m4 in height, situated on Mys Kodosh. A radiobeacon transmits from the lighthouse. See view [41].

From Mys Kodosh the coast trends eastward, becoming gradually lower, for about 8 cables to the mouth of Rechka Pauk, a small stream. Reka Tuapse flows through Dolina Tuapse, a valley which opens at the head of the bay. Between these two rivers is a flat-topped hill sloping down to the bay, on which stands the town of Tuapse. The eastern side of the mouth of Reka Tuapse is bounded by a light-coloured bluff, from which a line of whitish cliffs, similar to those at Gelendzhik, (page 387), extends southward.

Mys Kodosh and the shores of Bukhta Tuapse are fringed by a coastal bank which, with depths of less than 10m0, extends about  $1\frac{1}{2}$  cables off Mys Kodosh and as much as  $3\frac{1}{2}$  cables offshore abreast the mouth of Reka Tuapse. The nature of the bottom in the bay is mud and sand in depths of about 14m0, and sand in lesser depths.

**Current.**—The north-west-going coastal current is much felt in the vicinity of Mys Kodosh.

*Chart 2247, plan of Port Tuapse.*

**Port Tuapse.—Breakwaters and mole.—Dangers.—Navigational aids.**—The port of Tuapse is an artificial harbour protected by breakwaters and a mole. Zapadnyy mol, part of which is detached, extends  
5 about 2½ cables in a southerly direction from a position about one cable westward of the mouth of Rechka Pauk.

Yuzhnyy mol extends from the coast close westward of the mouth of Reka Tuapse in a south-westerly direction for about 2½ cables, and thence curves in a westerly direction for a further 2½ cables, the inner part being  
10 wider than the remainder.

A light is exhibited, at an elevation of 12m2 from a green, metal framework column, 8m0 in height, situated on the extremity of Yuzhnyy mol.

Yugo-Zapadnyy Volnolom, the south-western breakwater, which is detached, extends in a west-north-westerly direction for about 7 cables  
15 from a position about one cable south-westward of the outer end of Yuzhnyy mol. The channel between Yuzhnyy mol and Yugo-Zapadnyy Volnolom is closed.

A shoal with a depth of less than about 2m0 over it lies close westward of the north-western end of Yugo-Zapadnyy Volnolom.

20 A floating dock, situated about 6 cables north-westward of the south-eastern end of Yugozapadnyy Volnolom, is marked at its southern end by two pairs of *red fixed* lights, disposed vertically, and at its northern end by three *red fixed* lights, disposed vertically, and at its northern end by three *red fixed* lights, disposed horizontally.

25 A light is exhibited, at an elevation of 12m0 from a red metal framework tower, 8m5 in height, on the eastern end of Yugozapadnyy Volnolom (44° 05' N., 39° 04' E.).

The south-eastern breakwater, Pervomayskiy Volnolom, which is also detached, is about 2½ cables long in an east-north-easterly and west-  
30 south-westerly direction; it is situated about 2½ cables south-south-eastward of the southern entrance to the harbour, which lies between the head of Yuzhnyy mol and the eastern extremity of Yugo-Zapadnyy Volnolom.

A light-buoy, painted in black and white stripes and exhibiting a  
35 *white flashing* light, is moored about one cable west-south-westward of the western end of Pervomayskiy Volnolom (44° 05' N., 39° 05' E.).

Leading lights have been established for the southern entrance to the harbour. Five lights, disposed vertically, are exhibited, at an elevation of 19m0, from a white, metal framework pyramid, 17m0 in height,  
40 situated about 6 cables northward of the head of Yuzhnyy mol; three lights, disposed vertically are exhibited, at an elevation of 37m0, from a similar structure, 12m0 in height, situated about three-quarters of a cable northward of the front lights. These lights in line, bearing 006½°, lead westward of Pervomayskiy Volnolom and into the southern entrance  
45 to the harbour. In 1967, the leading line was dredged to a depth of 13m7 from seaward to the harbour entrance.

A number of mooring buoys are laid inside the harbour.

**Caution.**—Numerous obstructions and foul areas exist in the western part of the harbour, and in Novyy port within about one cable of  
50 the alignment of the leading light-structure.

**Quayage.—Depths.—Danger.**—The port of Tuapse consists of two harbours; Staryy (Old) port, in its western part, and Novyy (New) port, in its eastern part. The former is used by fishing vessels and the latter by ocean-going vessels.

55 Shirokiy mol, which divides the two harbours, extends south-westward from a position about 3 cables east-south-eastward of the mouth

**Chart 2247, plan of Port Tuapse.**

of Rechka Pauk; it is used both by passenger and cargo vessels. It is 320 metres long and, in 1968, had depths of 7 metres at berths Nos. 9 and 10 on its south-eastern side; of 8 metres at No. 11 berth at its head; and of up to 8 metres at Nos. 12 and 13 berths on its north-western side. 5

On the northern side of Novyy port, eastward of Shirokiy mol, the rocky coastal bank with depths of 5 metres and less over it extends about half a cable offshore.

A light-and-bell-buoy, painted red and exhibiting a *red flashing light every five seconds*, is moored in Novyy port southward of the above coastal bank, close eastward of the alignment of the leading light-structures and about  $2\frac{3}{4}$  cables southward of the front structure. 10

Sudoremontnaya naberezhnaya extends north-westward from the root of Shirokiy mol for 214 metres, and thence west-south-westward for 333 metres; here are berths Nos. 14, 15, 16 and 17, at which there were depths of 4m5 in 1968. Shirokiy mol and Sudoremontnaya naberezhnaya are both connected with the general railway system. 15

The former passenger pier, situated about  $3\frac{1}{2}$  cables east-south-eastward of the root of Shirokiy mol, is 162 metres long; in 1968, there were depths of 5 metres in berths Nos. 7 and 8, alongside each of its sides. 20

A submarine pipeline extends one cable southward from the shore, half a cable eastward of the root of the former passenger pier.

Neftyanoy pirs, or Petroleum pier, lies parallel with, and about  $1\frac{1}{2}$  cables within the inner part of Yuzhnyy mol. It is 400 metres long, and, in 1948, had depths of about 9m0 alongside the northern side and 10m0 alongside the southern side. Nos. 5 and 6 berths, each 160 metres long, are on its north-western side, and Nos. 3 and 4 berths, each 160 metres long, are on its south-eastern side. 25

The Naval repair basin for light craft, with two patent slips on its eastern side, is situated close northward of the root of Neftyanoy pirs. 30

In 1948, there were depths of about 8 metres in berths Nos. 1 and 2 alongside the western side of the inner part of Yuzhnyy mol. These berths are used by vessels loading petroleum products and are connected with the general railway system. A mooring buoy is situated about one cable south-eastward of the head of Neftyanoy pirs. 35

**Pilotage.**—Pilotage is compulsory and is available by day and night for vessels entering and leaving the port, or berthing.

Vessels proposing to enter the port must give 24 hours notice in advance; 4 hours before entering the port vessels must signal their exact time of arrival and request the services of a pilot at the same time. When leaving the port 2 hours notice is required for the services of a pilot. 40

**Anchorage.**—Two areas in which anchorage is permitted in the outer roads are indicated on the chart south-westward of Yugo-Zapadnyy Volnolom ( $44^{\circ} 5' N.$ ,  $39^{\circ} 04' E.$ ). 45

**Prohibited anchorage.**—Owing to the existence of a submarine cable, anchorage is prohibited in the southern entrance to the harbour, or within 85 metres of the northern side of Yuzhnyy mol.

See also prohibited anchorages on page 391. 50

**Caution.—Weather.**—Strong southerly winds render the entrance impossible, and southerly gales raise a short sea within the harbour, rendering anchorage there unsafe; nor can vessels remain alongside. Even when the weather is calm, waves dangerous to shipping, may enter the harbour; this phenomenon is known as 'Tyagun'. When the above conditions prevail vessels should proceed to sea. 55

*Charts 2246, 2247, plan of Port Tuapse.*

**Directions.—Caution.**—A vessel approaching Port Tuapse from westward is recommended to make for a position 7 miles westward of Mys Kodosh, and from this position to steer with Kodoshskiy light-structure ahead bearing 095°. When  $3\frac{1}{2}$  miles from the light-structure, course should be altered east-south-eastward to pass about 9 cables off Mys Kodosh; this course should be maintained until about 9 cables southward of the harbour entrance. Course should then be altered to keep the leading light-structure in line, bearing 006 $\frac{1}{2}$ °, and to pass westward of the light-buoy marking the south-western end of Pervomeyskiy volnolom.

A vessel approaching from southward should make for a position about 7 miles southward of the harbour entrance, and thence should steer on the alignment of the leading light-structures bearing 006 $\frac{1}{2}$ °.

The structures from which the leading lights are exhibited are exhibited are difficult to distinguish by day, owing to the surrounding trees and houses. The southern entrance to the harbour can be distinguished as the ends of Yugo-zapadnyy Volnolom and Yuzhnyy mol, on each side of this entrance, are painted white.

**Chart 2247, plan of Port Tuapse.**

**Regulations.**—The following are extracts from the Port regulations in force in 1964, which are liable to annual amendment. The complete regulations should be obtained on arrival in harbour:—

5. Vessels are only allowed to enter or leave the harbour one at a time.
8. Permission to enter harbour must be obtained from the Port Captain.
9. All vessels must display their National flag at the stern.
10. Vessels must anchor in Outer roads until pilot is embarked and pratique is received.

77. Vessels moving in the harbour must have an anchor ready for letting go.

**Tuapse.**—The town of Tuapse (44° 06' N., 39° 04' E.) is rapidly expanding and its industrial importance has increased since the port was connected by pipe line with Grozny oil-field in 1930. It is the centre of local administration and is a seaside resort. The port never freezes. There are several hospitals in the town. The main exports are oil and oil products. In 1938, the population was over 36,000.

**Port facilities.**—Small quantities of coal are maintained.

Fuel oil is available; it can be supplied by pipe line at Neftyanoy pirs, and at berths Nos. 1 and 2 at Yuzhnyy mol, at rates of up to 240 tons per hour.

Diesel oil is also available.

Fresh provisions can be obtained. Fresh water is laid on to all berths.

Repairs to machinery can be undertaken and there is a small foundry. There is a patent slip capable of taking small craft up to 50 tons displacement and there is a floating dock.

**Communications.**—There is regular sea communication with all U.S.S.R. Black sea and Sea of Azov ports.

There is communication with other Black sea ports; *see* page 8.

There is a radio station at Tuapse, *see* page 26.

**De-ratting.**—De-ratting can be carried out; *see* page 27.

*Chart 2246.*

**BUKHTA TUAPSE TO ZALIV SUKHUML.—Reka Tuapse to Reka Sochi.—Light.—Anchorages.**—From the mouth of Reka Tuapse the coast trends south-eastward in an almost straight line to Mys

*Chart 2246.*

Uch-Dere ( $43^{\circ} 40' N.$ ,  $39^{\circ} 37' E.$ ). The whole of this stretch of coast is intersected by numerous gorges or gullies, each with a river of the same name flowing through it. Gora Zhernsi, Gora Shugus and Gora Chura, described on page 373, are all good marks from an offing. 5

For about the first 6 miles to the mouth of Ushchel'ye Shuyuk the coast consists of a series of very white, moderately high, precipitous cliffs which are all very similar and quite bare. These cliffs are intersected by Ushchel'ye Dederkay and Ushchel'ye Shepsi, about 3 and  $4\frac{1}{2}$  miles, respectively, from the mouth of Reka Tuapse. The mouth of Ushchel'ye Shepsi is wider than those of Ushchel'ye Dederkay and Ushchel'ye Shuyuk, and a reef extends a short distance off a small point on its south-eastern side. Ushchel'ye Shuyuk can be identified by the two small, white houses of Shuyukskiy coastguard station which stands at its mouth. There are depths of 60 feet ( $18m3$ ), sand, about one mile off this stretch of coast. A bank with depths of 28 feet to 33 feet ( $8m5$  to  $10m1$ ) over it, is situated about 4 miles southward of the mouth of Ushchel'ye shepsi, and about 3 miles offshore. 10 15

South-eastward of Ushchel'ye Shuyuk, the cliffs are lower, more irregular, and less bare than those south-westward of it. Dolina Makopse, a valley about 2 miles south-eastward of Ushchel'ye Shuyuk, is wide and wooded. Ushchel'ye Ashe, about 3 miles farther south-eastward, can be distinguished by its steep sides and great depth, and Ushchel'ye Cheshkepe, about  $1\frac{1}{2}$  miles still farther south-eastward, by a high, irregularly-shaped cliff on its northern side, and a stretch of low coast south-eastward of it. 20 25

Between Ushchel'ye Cheshkhepe and Dolina Psezuapse about 3 miles south-eastward, a low, wooded plain extends inland for about half a mile to the foothills. This plain may be identified by a clump of tall poplars which is prominent from an offing. 30

Lazarevskoe village, situated on the western entrance point of Reka Psezuapse, is visible from an offing. Lazarevskiy light ( $43^{\circ} 54' N.$ ,  $39^{\circ} 21' E.$ ) is exhibited, at an elevation of 333 feet ( $101m5$ ), from the south-eastern side of the mouth of Dolina Psezuapse.

Anchoring and trawling are prohibited within an area, 4 miles in length, lying parallel with the coast and between about one mile and 2 miles seaward of the mouth of Reka Psezuapse; the area is indicated on the chart. 35

Anchorage can be obtained abreast the mouth of Reka Psezuapse, inshore of the prohibited anchorage area, in depths of less than 12 fathoms ( $21m9$ ), mud. There is a sandy beach on the south-eastern side of the mouth of this river, and Gora Boz-Tepe, described on page 373, is a good mark for making the anchorage. 40

Between the mouths of Reka Psezuapse and Reka Shakhe, about  $8\frac{1}{2}$  miles south-eastward, there are four more or less prominent gorges or gullies, named Tsuskhoadzh, Godlikh, Chukhukh and Chemitokvadzhe, and situated about 2,  $3\frac{1}{2}$ ,  $4\frac{1}{2}$  and  $5\frac{1}{2}$  miles, respectively, south-eastward of the mouth of Reka Psezuapse. 45

See view [42].

On the north-western side of Ushchel'ye Tsuskhoadzh there are some whitish, wooded cliffs of very diverse forms. These cliffs disappear on the south-eastern side of the gorge, but re-appear, becoming darker, near Ushchel'ye Godlikh. A large, white, triangular patch on the side of a hill some distance within the mouth of Ushchel'ye Godlikh, is a very prominent mark from an offing south-westward of the mouth of that gorge. 50 55

*Chart 2246.*

South-eastward of Ushchel'ye Godlikh the slopes of the coastal hills are steep, reddish-coloured and covered with dense forest, which extends to Ushchel'ye Chukhukkh. On the south-eastern side of the latter gorge  
 5 another forest rises from very low cliffs of a bright orange colour. Thence south-eastward, the cliffs become appreciably higher with reddish-yellow patches, and are intersected by more gullies. On the north-western side of the mouth of Ushchel'ye Chemitokvadzhe there is a small but prominent point.

10 The north-western side of Dolina Shakhe rises to a rounded hill with bare slopes, the summit of which is crowned by a belt of trees resembling a cock's comb; the south-eastern side of this valley rises gradually to a densely wooded hill. Golovinskiy coastguard station stands on the coast at the mouth of this valley.

15 The village of Golovinka is situated at the mouth of Reka Shakhe; a conspicuous tower stands at the south-eastern entrance point of the river.

Anchoring and trawling are prohibited within an area,  $2\frac{1}{2}$  miles in length, lying parallel with the coast and between a quarter of a mile and one mile from it, northward of the mouth of Reka Shakhe; the area is indicated on the chart.

Anchorage can be obtained off the mouth of Reka Shakhe, south-eastward of the prohibited anchorage area, in depths of 10 to 12 fathoms (18m3 to 21m9), mud and sand, with Mys Uch-Dere bearing about  $135^\circ$ .

25 Between the mouth of Dolina Shakhe and Mys Uch-Dere, about 9 miles south-eastward, the coast becomes lower with sandhills backing a sandy beach. This stretch of coast is intersected by four gullies, the most remarkable of which is Ushchel'ye Vardane, situated about 5 miles south-eastward of the mouth of Dolina Shakhe and covered with dense  
 30 forest. Vardane coastguard station stands at the mouth of this gully. The coast here is steep-to with depths of 24 feet (7m3) about 3 cables offshore.

Mys Uch-Dere ( $43^\circ 40' N.$ ,  $39^\circ 37' E.$ ) rises in a gradual slope, covered with tall trees; the buildings of a sanatorium, situated on a hill a short distance northward of the point, are visible from seaward.

35 A bank, with depths of less than 36 feet (9m1) over it, fringes Mys Uch-Dere and extends for about half a mile offshore.

From Mys Uch-Dere the coast trends south-eastward for about  $6\frac{1}{2}$  miles to the mouth of Reka Sochi and is intersected by Ushchel'ye Dagomys and Ushchel'ye Psakhe, about  $2\frac{1}{2}$  and  $4\frac{1}{2}$  miles, respectively, south-  
 40 eastward of Mys Uch-Dere. Within this stretch of coast the hills are covered with scattered trees and their lower slopes are cultivated.

Ushchel'ye Dagomys is wide and divided into two parts by a small, triangular hill. Reka Dagomys, a rapid stream, flows through the low ground at the foot of the hills.

45 Anchorage, in depths of 60 feet (18m3), can be obtained abreast the mouth of Ushchel'ye Dagomys.

*Charts 2246, 2235.*

**Sochi and approaches.—Aspect.**—The valley through which Reka Sochi flows is bounded south-eastward by a plateau on which, near  
 50 the coast, stands the town of Sochi. See view [43].

Gora Khukhup, described on page 373, is a good mark for making Sochi; there is a grey, circular stone tower on its summit. From north-westward, Gora Bytkh, described on page 373, merges with Gora Khukhup and only opens out when close inshore.

55 From seaward, a stone church with a bell tower will be seen in the town, and also many buildings standing in parks and gardens, both

**Charts 2246, 2235.**

on the plateau and on the low, eastern bank of Reka Sochi. A group of tall white buildings, near the coast north-westward of the town, stand out clearly against a dark background of wooded hills when approaching from southward.

Mys Socha-Bytkh, about three-quarters of a mile south-eastward of the church, is an indeterminate point of moderate elevation, formed by a spur from Gora Gytikh.

**Prohibited anchorage.**—An area in which anchoring and trawling are prohibited lies between  $1\frac{1}{2}$  and 3 miles offshore to seaward of the mouth of Reka Sochi.

**Chart 2246.**

**Pier.—Navigational aids.**—Sochinsky light is exhibited at an elevation of 120 feet (36m6) from a white stone tower adjoining a one-storeyed building, 33 feet (10m1) in height, situated on the summit of a cliff, about one cable west-south-westward of the church. A radiobeacon transmits from the lighthouse. In 1919, H.M.S. *Theseus* reported that the lower part of the lighthouse was hidden by trees, and the light itself, in 1958, was obscured close inshore when bearing more than  $149^{\circ}$ .

Leading light-beacons, from which lights are occasionally exhibited, have been established on the coast north-north-westward of Sochinskiy lighthouse. The front light is exhibited, at an elevation of 60 feet (18m3), from a white, rectangular shield with a black, vertical stripe 29 feet (8m8) in height, situated on a cliff about 5 cables north-north-westward of the lighthouse; the rear light is exhibited, at an elevation of 72 feet (21m9), from a turret on a house with a black stripe, 33 feet (10m1) in height, situated a short distance northward of the front light. These lights in line, bearing  $002^{\circ}$ , lead towards an anchorage.

A jetty is situated west-north-westward of Sochinskiy lighthouse ( $43^{\circ} 35' N.$ ,  $39^{\circ} 44' E.$ ); a light is exhibited from its head.

A mole projects from the coast west-south-westward of the lighthouse; a light is exhibited from a round tower on the extremity of the mole.

**Anchorage.—Buoy.**—Vessels usually anchor in depths of 31 feet (9m4), west-south-westward of the mole.

A red spar buoy surmounted by a cone, point down, is moored about  $2\frac{1}{2}$  cables westward of Sochinskiy lighthouse.

The roadstead off Sochi is completely open from north-west, through west to south-east; the nature of the bottom is mud and sand, with fine gravel close inshore. Vessels are advised to weigh and proceed to sea when southerly winds get up.

**Town.—Port facilities.—Radio station.**—The town of Sochi is the administrative centre of the district and is a health and summer resort. There is a hospital in the town. In 1967, there was a permanent population of about 182,000.

A number of tugs, barges and salvage craft are available. Fresh provisions are plentiful in summer but rather scarce in winter.

The town is connected with the general railway system. There is frequent sea communication with Odessa, Batumi and other U.S.S.R. Black sea ports. Special permission must be obtained for foreign vessels to visit the port.

There is a radio station at Sochi, *see* page 26.

**Life-saving.**—There is a life-saving station, equipped with a lifeboat, situated northward of the jetty.



*Chart 2235.*

**Mys Socha-Bytkh to Reka Khosta.—Coast.**—From Mys Socha-Bytkh the coast trends east-south-eastward for about 7 miles to the mouth of Reka Khosta. At first this stretch of coast rises to Gora Bytkh and Gora Khukhup, but thence it gradually becomes lower.

Matsesta sulphur springs are situated about one mile inland on the eastern bank of Reka Matsesta, which enters the sea about 5 miles east-south-eastward of Mys Socha-Bytkh. On the north-western side of the mouth of Reka Matsesta there is a pier, alongside which is a berth 100 feet (30m5) long with a depth of 10 feet (3m0).

**Bukhtochka Khosta.—Lights.—Anchorage.**—Bukhtochka Khosta is a small cove entered eastward of Mustakuba point ( $43^{\circ} 31' N.$ ,  $39^{\circ} 52' E.$ ) which projects a short distance south-westward from the general line of the coast about three-quarters of a mile west-north-westward of the mouth of Reka Khosta. On either side of the river mouth is a sandy beach, within which the land rises steeply and is densely wooded. On the north-western side of the mouth are the two buildings of a coastguard station, and on the south-eastern side of the mouth is a sawmill.

About 3 cables north-westward of the mouth of Reka Khosta is a T-shaped pier, 224 feet (67m0) long, alongside which is a berth, 33 feet (10m1) long, with a depth of 13 feet (4m0); the depths decrease gradually to the shore.

A coastal bank with depths of less than 30 feet (9m1) over it, extends up to half a mile off the shore of Bukhtochka Khosta; a 17-foot (5m2) detached, sandy patch lies in its north-western part, about  $1\frac{1}{2}$  cables offshore.

In calm weather boats can enter Reka Khosta, the mouth of which should be approached from south-south-eastward on account of a 2-foot (0m6) sandy shoal on the western side.

Leading lights have been established for approaching the pier. The front light is exhibited, at an elevation of 23 feet (7m0), from a quadrangular shield, painted yellow with a red, vertical stripe, and surmounted by a lozenge-shaped daymark, 11 feet (3m4) in height, situated on the head of the pier; the rear light is exhibited, at an elevation of 45 feet (13m7), from a lantern on the roof of the maritime railway station, about half a cable north-eastward of the front light. These lights in line, bearing  $053^{\circ}$ , lead towards the pier.

Small craft can find shelter from north-westerly winds in Bukhtochka Khosta, in depths of about  $3\frac{1}{2}$  fathoms (6m4), fine sand.

**Reyd Mezyumta.—Light.—Anchorage.**—Mys Kontsantinovskiy (Konstantin) ( $43^{\circ} 24' N.$ ,  $39^{\circ} 58' E.$ ), about 7 miles south-eastward of the mouth of Reka Khosta, is low and covered by dense trees which change to bushes near the extremity of the point. Near this point are two hummocks, known locally as Adlerskiye gorki or Adler hummocks, which, from an offing north-westward, serve to identify the vicinity, but, on a closer approach, become lost amongst many others.

Reka Mezyumta flows through Dolina Mezyumta and enters the sea about  $1\frac{1}{2}$  miles north-westward of Mys Konstantinovskiy. The village of Adler, in which there is a group of tall poplars, which are prominent from seaward, extends along the coast north-westward from the mouth of the river; close to the village is a pier, alongside which small craft can berth in calm weather. Reka Mezyumta flows very swiftly and spring freshets, due to the melting of snow on the mountains, inundates large areas behind the village.

Adlerskiy light is exhibited, at an elevation of 35 feet (10m7), from a white hut and gallery with a red vertical stripe, on a metal framework

**Chart 2235.**

structure, 24 feet (7m8) in height, situated on the coast about 7 cables north-westward of the mouth of Reka Mezymta. The light is obscured by trees and buildings on some north-westerly bearings.

The depths in the roadstead abreast the village are very irregular and increase very abruptly seaward. In depths of 48 feet (14m6), the bottom is mud and sand throughout the roadstead. 5

Anchorage may be obtained, in depths of about 60 feet (18m3), with Adlerskiy light-structure bearing 357°, distant 5 cables. Winds from seaward rarely blow home, but when strong, send in considerable swell. 10

**Adler.**—The village of Adler is a growing health resort; in 1938, the population was about 2,500. The chief exports are tobacco and fresh and dried fruits, and the principal imports are flour, groceries, hides, iron and other manufactured goods. Small quantities of fresh provisions may be obtained. 15

Adler is connected with the general railway system. There is regular sea communication with other Caucasian ports.

**Mys Konstantinoskiy to Mys Pitsunda.**—**Aspect.**—Between Mys Konstantinoskiy and Mys Pitsunda (43° 09' N., 40° 20' E.), a low, sandy promontory covered with pine trees about 23 miles south-eastward, the coast forms a wide bight, at the head of which is the small town of Gagry (Gagri). 20

From Mys Konstantinovskiy to Pilenkovo (Pilenkova) village, which stands on the slope of a hill rising from the sea about 6 miles eastward, coast is low and covered with bushes. Eastward of this village the character of the coast changes, and it begins to rise to hills, partly covered in trees and bushes, which increase in elevation eastward and merge into the dark forest-clad Gagry mountains. Within these mountains can be seen the peaks of the Caucasus range, which are covered in eternal snow. Eastward of the head of the bight the mountains recede inland, and there is an undulating coastal strip of considerable width. 25 30

Pilenkovo is one of the largest villages in the northern part of Gagry district. The coast in the vicinity is steep-to and clear of dangers. There is a hospital in the village. There is regular sea communication with Odessa and Batumi. 35

A deep cleft in the Gagry mountains, known as Gagrinskoye ushchel'ye or Gagry gap, is very prominent from an offing. Eastward of this gap there are three remarkable mountains, shaped like equilateral triangles, of which the westernmost is the highest.

The small seaside resort of Gagry, in which are the ruins of an old fortress, is situated on the coast below Gagrinskoye ushchel'ye. There are some conspicuous groves of tall poplars lining the coast in the vicinity. 40

In 1920, it was reported that the old fortress was invisible from seaward, but that a large grey building, resembling a castle, is built inside its walls; other prominent objects are a long white bathing-house, about one mile east-south-eastward of the old fortress, and a white building with a spire, situated near the coast about 8 cables farther south-eastward. 45

About 1½ miles south-eastward of Gagrinskoye ushchel'ye there is another gap or ravine, beyond which the coast is low and covered with bushes. 50

The village of Novyy Gagry, situated on the coast about 3 miles south-eastward of the old fortress, is the administrative centre of the Gagry district.

Reka Bzyb' (Bzuib) flows through a remarkable wide ravine, known as Pitsundskoye ushchel'ye or Pitsunda gap, and enters the sea a short 55

*Chart 2235.*

distance northward of a small point about  $3\frac{1}{2}$  miles north-westward of Mys Pitsunda. Reka Bzyb' is a large and rapid river, the outflow from which is noticeable a considerable distance offshore, especially after  
 5 heavy rains. The current in the river mouth is so rapid that even a heavy southerly swell is much reduced by it. Pitsundskoye ushel'ye is wider and more conspicuous from the offing than Gagrinskoye ushel'ye.

**Caution.**—Two small areas, in which navigation is restricted, extend for about one and 2 miles offshore from the southern and northern entrance  
 10 points of Reka Bzyb'.

**Light.—Radiobeacon.**—Pitsundskiy light is exhibited at an elevation of 119 feet (36m3), from a white framework tower with a central column, 101 feet (30m1) in height, situated on Mys Pitsunda. A radiobeacon transmits from the lighthouse. See view [44]. The lighthouse stands out against  
 15 a background of tall pine trees; in 1919, it was reported that the lighthouse was partly hidden by these trees.

**Gagrinskiy reyde.—Lights.—Anchorage.**—The area available for anchorage in Gagrinskiy reyde is restricted by the considerable depths which oblige vessels to anchor close inshore. Throughout the roadstead in  
 20 depths of more than 48 feet (14m6), the nature of the bottom is ooze.

Leading light-beacons have been established for approaching the anchorage. The front light ( $43^{\circ} 19' N.$ ,  $40^{\circ} 16' E.$ ) is exhibited, at an elevation of 168 feet (51m2), from a white, rectangular shield with a black, vertical stripe and triangular topmark, 16 feet (4m9) in height, situated on  
 25 the chimney of a building on the shore near the old fortress; the rear light is exhibited, at an elevation of 217 feet (66m1), from a similar structure, 21 feet (6m4) in height, situated on the hillside a short distance north-north-eastward of the front light. These light-beacons in line, bearing  $026^{\circ}$ , lead to the anchorage.

Leading light-beacons have been established near the mouth of a river (Reka Gagrysh), about one mile east-south-eastward of the old fortress of Gagry, to indicate the position of the anchorage. The front light is exhibited, at an elevation of 39 feet (11m9), from a white, framework structure surmounted by a ball, 22 feet (6m7) in height, situated on the  
 35 coast about one cable north-westward of the mouth of this river; the rear light is exhibited, at an elevation of 99 feet (30m2), from a similar structure, 15 feet (4m6) in height, about  $1\frac{1}{2}$  cables east-south-eastward of the front light. These light-beacons in line, bearing  $108^{\circ}$ , indicate the position of the anchorage. It is reported that the rear light-structure is difficult  
 40 to distinguish by day, and at night, the light is partly obscured from south-eastward.

The usual anchorage is in depths of 20 fathoms (36m6), about 3 cables offshore, abreast the first of the remarkable mountains eastward of Gagrinskoye ushel'ye. This berth is sheltered from the heavy squalls  
 45 which, at times, blow down the gap. When abreast the mountains, there is a flat calm at night, a land breeze may be found blowing from the gap. South-westerly winds rarely blow home.

The road abreast Novyy Gagry does not afford good anchorage the bottom being sand and poor holding ground. With a freshening wind  
 50 vessels lying here usually shift berth to the anchorage off Gagry.

**Gagry.**—There is a pier, with a depth of 8 feet (2m4) at its head, southward of the old fortress at Gagry, on the line of the leading lights for the approach to the anchorage. There is a hospital in the town. Fresh provisions are obtainable in limited quantity.

55 There is sea communication with U.S.S.R. Black sea and Sea of Azov ports.

*Chart 2235.*

**Pitsundskiy reyd.**—**Dangers.**—Pitsundskiy reyd is entered between Mys Pitsunda ( $43^{\circ} 09' N.$ ,  $40^{\circ} 20' E.$ ) and Mys Tolstyy (Tolstoi), about  $5\frac{1}{2}$  miles eastward; it is open from south-east, through south, to west-south-west. The western shore of the road is low and sandy and backed by a pine forest; the eastern shore consists of a series of cliffs and gullies covered with a larch wood. Mys Tolstyy is bluff and is fringed by a rocky bank which extends about  $2\frac{3}{4}$  cables south-westward,  $2\frac{1}{2}$  cables southward, and  $4\frac{1}{2}$  cables south-eastward from it. Near the head of the road there are the prominent buildings of a fishery station and a small pier used by small craft. There is another small pier about 6 cables north-north-eastward of Pitsundskiy lighthouse.

The western shore of the road is steep-to, with depths of 30 feet (9m1) about half a cable, and of more than 20 fathoms (36m6), about 2 cables offshore; its eastern shore is fringed by a bank, with depths of less than 30 feet (9m1), which extends from 2 to 3 cables offshore and on which there are numerous sunken rocks as much as about one cable offshore.

In 1937, a submerged obstruction was reported in the north-eastern part of the road, about  $2\frac{1}{2}$  miles east-north-eastward of Pitsundskiy lighthouse and about  $4\frac{1}{2}$  cables offshore.

Two 18-foot (5m5) rocks lie about 4 and 5 cables, respectively, west-north-westward of Mys Tolstyy.

There are depths of about 25 fathoms (45m7) midway between the entrance points; thence the depths increase towards Mys Pitsunda, about one cable off which there are depths of 35 fathoms (64m0). Toward the head of the road and off Mys Tolstyy the depths decrease fairly regularly.

When there is no swell there is good landing southward of Pitsundskiy lighthouse.

There is sea communication with Sochi and Sukhumi.

**Bomborskiy reyd.**—**Light.**—**Dangers.**—Bomborskiy (Bombori) reyd is entered between Mys Tolstyy and Mys Souk-Su (Suksu), about  $5\frac{1}{2}$  miles eastward; the roadstead is open from south-east, through south, to north-west. On the eastern side of Mys Tolstyy there are some white cliffs, but thence a plain covered with dense forest, rises gradually to the foothills. Towards Mys Souk-Su the coast becomes low and there are a number of clearings in the forest.

Mys Souk-Su ( $43^{\circ} 06' N.$ ,  $40^{\circ} 35' E.$ ) is low and covered with forest; near this point is the large village of Bombory (Bombori). The point is fringed by an extensive rocky bank which extends about  $7\frac{1}{2}$  cables westward,  $6\frac{1}{2}$  cables south-westward, and 4 cables southward from it.

Souk-Su light is exhibited, at an elevation of 53 feet (16m2), from a white-iron, framework beacon, 40 feet (12m2) in height, situated on Mys Souk-Su.

About midway between the entrance points of Bomborskiy reyd there are depths of about 66 feet (20m1), decreasing regularly towards the shore. In depths of 48 feet (14m6) and less, the bottom is sand, and in greater depths, sand and mud.

Near Mys Ambra, a small point situated about one mile eastward of Mys Tolstyy, is the mouth of Rechka Myussery, a stream which flows through a wide valley. The village of Myussery (Myuzurkhya) which is situated near the mouth of this stream, has a small camber in which small craft with local knowledge, not exceeding 10 feet (3m0) in draught, can berth. The white buildings of the village show up well against the dark background of forest.

Between the camber and Mys Tolstyy there are several 10-foot (3m0) patches, and large vessels should not approach the village.

*Chart 2235.*

- A bank with depths of less than 30 feet (9m1), on which there are several submerged rocks with depths of from 10 to 23 feet (3m0 to 7m0) over them, extends about 8 cables south-south-eastward from Mys Ambra, and a similar bank, near the outer edge of which there are two rocks with depths of 24 and 28 feet (7m3 and 8m5), extends about 5½ cables off the eastern side of the road, about 1½ miles north-westward of Mys Souk-Su.

- Mys Souk-Su to Mys Sukhumiyskiy.—Dangers.**—From Mys Souk-Su the coast trends eastward for about 13 miles and thence south-eastward for about 7½ miles to Mys Sukhumiyskiy (Sukhum), forming a wide bight. This stretch of coast is low but rises in hillocks, some of which are wooded, and within them a level-topped range of mountains extends eastward from Gagry mountains. From an offing, the snow-covered peaks of a distant range can be seen. Gora Tseferbeya-Shapka, described on page 373, is a good mark in this vicinity.

- The shores of the bight are fringed by a bank with depths of less than 30 feet (9m1) and on which there are some above-water and sunken rocks, which extends as much as 5 cables off the northern shore. In depths of 24 feet (7m3) and less, the bottom is sand and mud, and in greater depths, mud. The depths in the bight increase regularly seaward.

- Gudautskaya bukhta.—Dangers.—Light.—Anchorage.**—Gudautskaya bukhta is a small bight entered about 2½ miles eastward of Mys Souk-Su. Rough ground extends about one mile off its north-eastern side and a 30-foot (9m1) rocky patch lies about 1½ miles south-eastward of Gudauty light-structure. The town of Gudauty (Gudaut) is situated on a hill about 70 feet (21m3) high, rising from the western side of the head of the bay.

- Gudauty light is exhibited, at an elevation of 54 feet (16m5), from a small hut on a framework structure, surmounted by a rectangular shield, both painted red with a white vertical stripe, 14 feet (4m3) in height, situated close within the coast near the town of Gudauty.

- Vessels with local knowledge can obtain anchorage in convenient depths, mud and sand, abreast the town. There is a pier with a depth of about 8 feet (2m4) at its head, about 4 cables east-north-eastward of Gudauty light-structure.

Fever is prevalent in Gudauty in summer. There is a hospital in the town.

There is sea communication with Caucasian and Crimean ports and with Odessa.

- Psyrtkha anchorage.—Danger.—Lights.**—Psyrtkha farm 43° 05' N., 40° 50' E., formerly Novo-Afonskogo (Novo Afonski) monastery, stands on the coast about 10½ miles eastward of Mys Souk-Su; Rechka Psyrtkha, a small stream, flows into the sea about 1½ cables westward of the farm. Some prominent buildings, including the church of the former monastery, stand about half way up the hill-side and can be seen from a considerable distance seaward. On the western side of the mouth of Rechka Psyrtkha is a small but distinctive hill which appears rounded from south-westward, but from south-eastward appears pointed with a bare, rocky ridge.

- The coastal bank which, with depths of less than 30 feet (9m1) fringes this part of the coast, extends about 5 cables southward of Psyrtkha farm; on this bank, a ledge of sunken rocks, with depths of from 12 to 21 feet (3m7 to 6m4), extends about 3½ cables southward from Mys Psyrtkha, a small, low point about one mile westward of the mouth of Rechka Psyrtkha.

- A pier, with a depth of 9 feet (2m7) at its head, projects from the coast abreast Psyrtkha farm. A light is occasionally exhibited, at an elevation of

**Chart 2235.**

35 feet (10m7, from each of two posts, situated one on either side of the pier about midway along it.

Anchorage can be obtained, in a depth of 33 feet (10m1) southward of Psyrkha farm.

There is sea communication with Caucasian and Crimean ports and with Odessa.

**Chart 2263.**

**Coast.—Prohibited anchorage.—Prohibited area.**—Reka Gumista flows into the sea about  $2\frac{1}{2}$  miles north-north-westward of Mys Sukhumyskiy. A rocky bank, with depths of less than 18 feet (5m5), extends half a mile from the coast between  $1\frac{1}{2}$  and 3 miles north-westward of the river mouth.

Anchoring and trawling are prohibited within an area, indicated on the chart, which extends about one mile on each side of the mouth of Reka Gumista, and about 6 cables seaward.

South-eastward of the above area there is an area in which navigation is prohibited, extending to  $1\frac{1}{2}$  miles south-eastward and three-quarters of a mile south-westward of Mys Sukhumyskiy; the area is indicated on the chart.

**ZALIV SUKHUMI.—Dangers.**—Zaliv Sukhumi is entered between Mys Sukhumyskiy ( $42^{\circ} 59' N.$ ,  $40^{\circ} 59' E.$ ) and Mys Kodor, about 10 miles south-eastward. Mys Sukhumyskiy is low, sandy and very steep to especially on its south-eastern side; Mys Kodor also is low. Approaching from north-westward, the position of the bay may be identified by a hill shaped like a trapezium which rises gradually east-north-eastward of Mys Sukhumyskiy and dominates the town of Sukhumi which is situated at the head of the bay. The eastern shore of the bay rises to foothills, but these gradually recede inland and the coast becomes lower as Mys Kodor is approached. See view [45].

A conspicuous tower stands on the coast, 6 miles east-south-eastward of Mys Sukhumyskiy.

The coastal bank which, with depths of less than 30 feet (9m1) fringes Mys Sukhumyskiy, is very narrow near the point, but between one and 2 miles east-north-eastward of the point, it widens and extends as much as 4 cables offshore. Several sunken rocks, with depths of 9 feet (2m7) and less over them, lie about half a cable offshore on the north-eastern part of this bank, and a detached 16-foot (4m9) patch lies near its outer edge, about  $2\frac{1}{2}$  cables offshore and about  $1\frac{1}{2}$  miles east-north-eastward of Mys Sukhumyskiy.

**Navigational aids.**—Sukhumyskiy light is exhibited, at an elevation of 121 feet (36m9), from a white, circular, metal tower, 109 feet (33m3) in height, situated on Mys Sukhumyskiy. A fog signal is sounded, and a radiobeacon transmits from the lighthouse. See view [45].

A light is exhibited, at an elevation of 52 feet (15m8), from a white, metal, framework column, 40 feet (12m2) in height, situated on Mys Kodor.

Two light-beacons have been established on the old fortress of Sukhumkale, situated on the coast at the south-western end of the town, about  $2\frac{1}{2}$  miles east-north-eastward of Mys Sukhumyskiy. The front light is exhibited, at an elevation of 38 feet (11m6), from a red, framework mast on a masonry pyramid surmounted by a ball, 30 feet (9m1) in height; the rear light is exhibited, at an elevation of 61 feet (18m6), from a similar structure, 53 feet (16m2) in height, situated about half a cable west-north-westward of the front light. These light-beacons in line, bearing  $285^{\circ}$ , indicate the southern limit of the anchorage in Sukhumyskiy reyd.

*Chart 2263.*

A light is exhibited from a stranded wreck one mile east-north-eastward of Mys Sukhumiyskiy, and about 2 cables offshore.

- Anchorage.**—Safe anchorage may be obtained in Sukhumiyskiy rey, in depths of from 18 to 20 fathoms (32m9 to 36m6), on the line of the light-beacons on the old fortress. The depths increase very rapidly a short distance southward of this line and care should be taken not to anchor southward of it. Small craft can obtain anchorage nearer the town.

- It is reported that south-westerly winds seldom blow home but, at times, send in an unpleasant sea. Land winds are sometimes troublesome.

**Prohibited anchorage.**—Anchoring and trawling are prohibited within an area which extends eastward from Mys Sukhumiyskiy to the eastern shore of Sukhumiyskiy zaliv, and between about half a mile and one mile from its northern shore; the area is indicated on the chart.

- Piers.—Lights.—Fog signal.**—Three piers project from the shore abreast the western part of the town. Pristan' Dinamo, the westernmost pier, is 602 feet (183m5) long, with a depth of 8 feet (2m4) at its outer end. The middle pier, a loading pier, is 182 feet (55m5) long, with a depth of 12½ feet (3m9) at its outer end; Passazhirskaia pristan' or Passenger pier (43° 10' N., 41° 02' E.) is situated eastward of the middle pier.

A pair of leading lights, in line bearing 352½°, are exhibited from the head of the middle pier.

- Sukhumi.—Port facilities.—Radio station.**—The town of Sukhumi is the centre of local administration and is a health resort of some importance. It is sheltered from the cold northerly and north-easterly winds by high, snow-covered mountains, and, in consequence, the climate is mild. There are two hospitals in the town. In 1967, the population was about 88,000.

- Fresh provisions are plentiful. Fresh water is laid on to Passazhirskaia pristan'.

Some mobile cranes are available.

There is regular sea communication with U.S.S.R. Black sea and Sea of Azov ports. *See* page 8.

There is a radio station at Sukhumi, *see* page 26.

- Storm signals.**—Storm signals, *see* page 18, are shown from a mast near the root of Pristan' Dinamo.

- ZALIV SUKHUMI TO PORT POTI.—Mys Kodor to Mys Iskuriya.—Dangers.**—Reka Kodor, which is wide and rapid, flows through a deep gorge and enters the sea through a delta about 2½ miles south-eastward of Kodor light-structure, described on page 403, by several branches, all of which are too shallow even for boats. The gorge is prominent from an offing southward of the parallel of Mys Kodor. About 3½ miles within the mouth of Reka Kodor is the old fortress of Dranda in which there is an ancient church which is visible when abreast the river mouth.

The coastal range of the Caucasus mountains trends eastward from within Mys Kodor, and an extensive plain covered with primeval forest extends south-eastward within the coast.

- From Mys Kodor the coast trends south-eastward for about 3½ miles to Mys Baglan, and thence east-south-eastward for about one mile to Mys Iskuriya a low and tree-covered point, the extremity of which is remarkable for the whiteness of its beach.

Gora Olen' (42° 24' N., 41° 50' E.), described on page 373, is an excellent mark when southward of Mys Iskuriya, *see* view [46].

- Between Mys Baglan and Mys Iskuriya the coast is fringed by a bank

**Chart 2263.**

with depths of less than 30 feet (9m1), on which there are numerous sunken rocks, and which extends about 2½ cables off both points.

**Prohibited anchorage.**—Anchoring and trawling are prohibited within about one mile of the coast between Mys Kodor and Mys Iskuriya; the limits of the area are indicated on the chart. 5

**Zaliv Skurdzha.**—**Dangers.**—**Anchorage.**—Zaliv Skurdzha is entered between Mys Iskuriya and Mys Tamush about 6 miles eastward. Several small rivers flow into this bay, and at the mouth of Reka Tskhur-Gili, about 1½ miles east-north-eastward of Mys Iskuriya, is a conspicuous house, a pier and a timber yard; the long wood-sheds of the latter are visible from a considerable distance seaward. 10

A continuation of the bank off Mys Iskuriya fringes the shore of the bay and extends as much as 8 cables offshore in places.

A group of rocks, with depths of less than 6 feet (1m8) over them, lie near the edge of the bank, about 1½ miles westward of Mys Tamush and about three-quarters of a mile offshore. 15

The village of Akhali Zindgi is situated on the north-eastern side of Zaliv Skurdzha, about 2 miles north-westward of Mys Tamush. A light is exhibited on the coast at the south-eastern end of the village. 20

Anchorage, with good holding ground and shelter from north-westerly winds, can be obtained in convenient depths in Zaliv Skurdzha.

**Ochamchirskiy harbour.**—**Navigational aids.**—**Spoil ground.**—Ochamchirskiy port, an artificial harbour, consisting of a basin with two wharves, is situated near the mouth of Reka Mokva, about 5 miles east-south-eastward of Mys Tamush, and about 2½ miles north-westward of the town of Ochamchire. The entrance to the basin is protected by two moles. 25

A channel, 246 feet (75m0) wide, leads between the moles and into the basin; in 1965, there were depths of 21 feet (6m4) in the channel and in the basin. 30

Leading light-beacons have been established for entering the basin. The front light is exhibited, at an elevation of 36 feet (11m0), from a white tripod surmounted by a white disc, 33 feet (10m1) in height, situated close within the northern side of the basin; the rear light is exhibited, at an elevation of 52 feet (16m0), from a similar structure, 49 feet (14m9) in height, situated about 1½ cables northward of the front light. These light-beacons in line, bearing 359½°, lead through the channel and into the basin. 35

A light is exhibited, at an elevation of 36 feet (11m0), from a red, metal, framework column, 23 feet (7m0) in height, situated on the head of the eastern mole (42° 44' N., 41° 26' E.). 40

A light-buoy, painted red and exhibiting a *red flashing* light showing a *short flash every two seconds*, is moored on the western side of the channel close off the head of the western mole. 45

In addition to the light-structures on the eastern mole, the buildings of the Harbour Office, which stand on a small hillock, form a good mark for vessels approaching the harbour.

An area of spoil ground, indicated on the chart, lies close offshore half a miles south-eastward of the head of the eastern mole. 50

**Anchorage.**—**Light.**—The anchorage is situated in Reyd Ochamchire, the roadstead off the town, about 2½ miles south-eastward of the harbour. It is exposed to southerly and westerly winds, and is dangerous during winter months. The depths shoal very gradually inshore, there being depths of from 54 to 60 feet (16m5 to 18m3) about 1½ miles offshore, and of 30 feet (9m1) from 6 to 7 cables offshore. The bottom is ooze in depths of 55



*Chart 2263.*

over 30 feet (9m1), and mud and sand in lesser depths. The best berth is abreast the pier, which has a depth of 12 feet (3m7) alongside its head. Both northward and southward of this berth coastal flats are said to be forming  
 5 due to deposits brought down by the rivers.

A light is exhibited, at an elevation of 67 feet (20m4), from a white metal framework tower, 59 feet (18m0) in height, situated at Ochamchire.

**Ochamchire.**—The town of Ochamchire is situated on low, marshy ground, covered with forest, at the mouth of Reka Galizga. The church,  
 10 about 1½ miles eastward of the river mouth, is conspicuous. The neighbourhood is subject to malaria. The exports are coal, tobacco, boxwood and walnuts. In 1938, the population was about 6,000, but the town is growing rapidly on account of the recent construction of Ochamchirskiy harbour and the consequent export of coal from neighbouring coalfields,  
 15 which is becoming the principal industry.

There is sea communication with Odessa and Batumi.

**Reyd Ochamchire to Redut-Kale.**—**Lights.**—**Anchorage.**—From the mouth of Reka Galizga the coast trends south-south-eastward for 19 miles to Mys Anakliya, and is low and overgrown with small larches,  
 20 with occasional groups of tall poplars. Several small rivers enter the sea along this stretch of coast, their mouths being well-defined by the yellow discolouration due to their outflows. Sandy ridges, parallel with the coast, are formed off the mouths on these rivers by the surf, and, in places, extend as much as 3 cables offshore. Except for these ridges, this stretch of coast  
 25 is steep-to, with depths of 36 feet (11m0) from about one to 1½ miles offshore.

There is a village at the mouth of Reka Gudava, 5 miles south-south-eastward of Reka Galizga. Here small craft with local knowledge can anchor close inshore.

30 Reka Ingur flows into the sea on the southern side of Mys Anakliya (42° 23' N., 41° 34' E.). After heavy rain, the discolouration caused by its outflow extends up to 3 miles offshore. On the southern side of its mouth there is a large village with some ruined fortifications, and a sawmill with an iron chimney. The mouth of the river is obstructed by a narrow, sandy  
 35 spit, which extends from the northern side more than half-way across it, and entry is only practicable for small craft with local knowledge drawing not more than 3 feet (0m9). In the river mouth, the bottom is sand and mud.

Anakliya light is exhibited, at an elevation of 51 feet (15m5), from a red square metal structure carrying a white rectangular daymark with a black  
 40 central stripe, 42 feet (12m8) in height, situated on the wall of the ruined fortress near Mys Anakliya. A daymark, consisting of a black diamond on a large, white patch, has been painted on the wall below the light-structure.

Vessels with local knowledge can obtain anchorage in a depth of 15 fathoms (27m4), mud, about one mile off the mouth of Reka Ingur; closer  
 45 inshore, the depths decrease rapidly. Vessels should not attempt to anchor southward of the river mouth as the depths there are too great.

At night, vessels should anchor with Anakliya light bearing between 045° and 088°. This anchorage is quite open and is unsafe with onshore winds or swell.

50 From Mys Anakliya the coast trends south-south-eastward for about 7½ miles to Redut-Kale, which lies at the mouth of Reka Khobi. A sandy ridge which is nearly awash, lies parallel with, and about one cable off this stretch of coast; there are depths of about 9 feet (2m7), sand and mud, between this ridge and the coast. The seaward side of the ridge is  
 55 shelving. Two mooring buoys, with an obstruction close north-eastward, are situated about 3½ miles north-north-westward of the mouth of Reka

*Chart 2263.*

Khobi; another mooring buoy lies  $2\frac{1}{2}$  miles farther north-westward.

From seaward, some small buildings can be seen on the southern side of the mouth of Reka Khobi, behind which buildings there is a very distinctive clump of tall poplars. Gora Olen' ( $42^{\circ} 24' N.$ ,  $41^{\circ} 50' E.$ ), described on page 373, is a very good mark for making Redut-Kale; it is in line with the mouth of Reka Khobi when bearing  $053^{\circ}$ . Gora Poti rises about 14 miles south-eastward of Gora Olen'. See view [46].

A light is exhibited, at an elevation of 26 feet (7m9), from a wreck stranded off the coast at the mouth of Reka Khobi.

The mouth of Reka Khobi is obstructed by a bar which is liable to shift. The current in the river mouth attains a rate of as much as 6 knots when the river is in flood, making the bar dangerous and causing heavy breakers with any onshore wind or swell. In general, the river can only be entered by boats when there is no swell. Provided the surf is not too great, landing can be effected on the southern side of the river mouth when entry is impossible due to the strength of the current. The area of the northern side of the river mouth is very shallow. Within the bar, the depths for several miles upstream are considerable.

In 1938, the population of Redut-Kale was about 1,000; the area is subject to malaria.

Reyd Redut-Kale lies off the mouth of Reka Khobi. Within depths of 18 feet (5m5), which extends about 3 cables offshore, there may be dangers caused by silt. Thence the depths increase gradually and regularly to 13 fathoms (24m0) about  $1\frac{1}{2}$  miles offshore; farther offshore, the depths are very irregular. Throughout Reyd Redut-Kale, the bottom is mud in depths of over 27 feet (8m2), and in lesser depths, sand and mud.

Vessels with local knowledge can obtain anchorage in a depth of 12 fathoms (21m9), sand, about  $1\frac{1}{2}$  miles off the mouth of Reka Khobi with Mys Anakliya bearing  $343^{\circ}$  and Gora Olen' bearing  $056^{\circ}$ .

Two detached shoals, each with a depth of 59 feet (18m0) over it, lie  $2\frac{1}{2}$  miles west-south-westward and  $4\frac{1}{2}$  miles south-south-westward, respectively of Redut-Kale.

**Current.**—In Reyd Redut-Kale an almost constant current sets north-north-westward along the shore at a normal rate of from half a knot to  $1\frac{1}{2}$  knots. When Reka Khobi is in flood, and after prolonged winds from seaward, the rate may attain 2 knots.

**Prohibited anchorages.**—Anchoring and trawling are prohibited within an area, indicated on the chart, half a mile in width, extending 3 miles west-north-westward from a position  $3\frac{1}{2}$  miles southward of Redut-Kale.

*Charts 2263, 2247, plan of Port Poti.***PORT POTI AND APPROACHES.—Dangers.—Navigational aids.**

From the mouth of Reka Khobi the coast trends southward for  $4\frac{1}{2}$  miles to the northern mouth of Reka Rioni which is obstructed by a shallow bar and several islets. The coastal bank, with depths of less than 60 feet (18m3), extends about  $1\frac{1}{2}$  miles offshore; three spar buoys, each surmounted by two cones, bases together, are moored near the edge of the coastal bank about  $1\frac{1}{2}$  miles south-westward, westward and north-westward, respectively, of the river mouth. Reka Rioni is the largest of the rivers flowing into the eastern part of the Black Sea, and is navigable for about 48 miles above its mouth.

Three and 4 miles, respectively, southward of the northern mouth of Reka Rioni are situated the two southern mouths of the river, now nearly

*Charts 2263, 2247. plan of Port Poti.*

blocked; between them lies Ostrov Bol'shoy, on which stands a suburb of the town of Poti.

- Potiyskiy light ( $42^{\circ} 08' N.$ ,  $41^{\circ} 39' E.$ ) is exhibited, at an elevation of  
 5 118 feet (36m0) from a white, round, metal tower 111 feet (33m8) in height, situated at the southern end of Ostrov Bol'shoy. A radiobeacon transmits from the lighthouse.

**Conspicuous objects.**—The approach to Port Poti presents no difficulty in clear weather. Ostrov Bol'shoy and the adjacent coast are  
 10 low-lying, but a conspicuous silo in the southern part of the harbour affords a good landmark, is visible at a great distance and makes a good radar target. Also conspicuous is a building with a cupola, situated about 8 cables north-eastward of Potiyskiy light. Gora Olen' is a most useful mark for approaching the port.

- 15 A conspicuous radio mast, 125 feet (38m1) high, from which *red* obstruction lights are exhibited, stands about  $1\frac{1}{2}$  miles north-eastward of the harbour.

**Cautions.**—In thick weather, caution is necessary in the approach to the port as the depths diminish rapidly towards the land, and the current sets  
 20 northward. Vessels are cautioned to adhere strictly to the leading lines when approaching the harbour.

Shoaling is taking place near the northern mouth of Reka Rioni and in consequence the depths may differ from those shown on the chart.

- Dangers.**—**Navigational aids.**—The western side of Ostrov Bol'shoy  
 25 is fringed by a bank with depths of less than 10m0, which extends 2 cables offshore at the northern end of the island, but up to  $1\frac{1}{2}$  miles westward of its southern end. A spar buoy, surmounted by two cones, bases together, is moored 13 cables westward of Potiyskiy lighthouse, and marks the western edge of the bank.

- 30 A pair of leading beacons is situated near the coast, about 3 miles northward of Potiyskiy lighthouse; in line, bearing  $040^{\circ}$ , the beacons lead from south-westward, clear of the bank which extends westward from Ostrov Bol'shoy, to within half a mile of the harbour entrance.

*Chart 2247, plan of Port Poti.*

- 35 **PORT POTI.**—**General remarks.**—Port Poti ( $42^{\circ} 09' N.$ ,  $41^{\circ} 39' E.$ ) is entered between the northern end of Zapadnyy mol and the head of Novyy Severnyy mol, the entrance being about three quarters of a cable wide.

- The harbour is accessible throughout the year except in severe weather  
 40 from west or north-west, when the "tyagun" (*see* page 393) or backwash from the shore raises a heavy sea off the head of Zapadnyy mol. North-westerly gales occasionally cause silting in the entrance and basins, decreasing the depths by up to 0m6. Dredgers are constantly at work removing this silt. In 1968 there was a depth of 9m3 on the leading line  
 45 up to the entrance of the harbour, and general depths of 6m0 to 10m6 in the harbour.

**Port Limits.**—The limits of the port are contained between the parallels of  $42^{\circ} 12' N.$  and  $42^{\circ} 05' N.$ , seaward for a distance of 10 miles.

- The outer roads are included in an area 2 miles wide from the coastline,  
 50 between the parallels of  $42^{\circ} 12' N.$  and  $42^{\circ} 08' N.$

**Anchorage.**—Anchorage is permitted in the outer roads in two areas, indicated on the chart, the northern area being westward of the northern mouth of Reka Rioni and the southern area westward of Zapadnyy mol.

- The anchorage for non-degaussed vessels is  $2\frac{1}{2}$  miles west-south-west-  
 55 ward of the head of Zapadnyy mol.

**Description of port.**—The root of Yuzhnyy mol is situated about one

*Chart 2247, plan of Port Poti.*

mile north-north-westward of Potiyskiy light; the mole curves in a westerly direction for about  $2\frac{3}{4}$  cables, and thence turns northward to form Zapadnyy mol for about 3 cables and then north-north-westward for a further 4 cables, forming a slight elbow.

Novyy Severnyy mol extends  $3\frac{1}{2}$  cables westward from the coast about  $6\frac{1}{2}$  cables northward of the root of Yuzhnyy mol.

Severnyy mol extends about  $2\frac{1}{2}$  cables westward,  $3\frac{3}{4}$  cables northward of the root of Yuzhnyy mol, forming an inner harbour the entrance to which, between the head of Severnyy mol and the elbow of Zapadnyy mol, is about three-quarters of a cable wide. A spur extends  $1\frac{1}{4}$  cables northward from near the head of Severnyy mol, and another spur extends one cable south-south-eastward from Novyy Severnyy mol; between the heads of these spurs is the entrance, about half a cable in width, to a basin lying between the two moles.

Sredniy mol ( $42^{\circ} 09' N.$ ,  $41^{\circ} 39' E.$ ), a wide mole, 256 metres long, extends westward from the shore about midway between the roots of Yuzhnyy mol and Severnyy mol and divides the harbour into two basins, known as Yuzhnaya gavan' and Severnaya gavan', respectively. An inner basin, known as Vnutrenniy basseyn, is entered from the eastern side of Severnaya gavan' through an entrance 64 metres wide. There are quays on the southern side of Severnyy mol, on both sides of Sredniy mol and for a short distance southward of its root, and on the northern and southern sides of Vnutrenniy basseyn. A small L-shaped wharf projects from the eastern end of Vnutrenniy basseyn; in 1965 a small floating dock was moored close westward of this wharf. There are mooring buoys in Yuzhnaya gavan'.

In 1956, there were depths of about 6m4 alongside the southern side of Severnyy mol, both sides of Sredniy mol and the quay extending southward from its root; there were depths of 5m5 to 7m6 alongside the northern side of Vnutrenniy basseyn, and of from 6m4 to 7m0 alongside its southern side. There is an area of foul ground, indicated on the plan, on the southern side of Yuzhnaya gavan'.

In Novyy port, the basin which lies between Severnyy mol and Novyy Severnyy mol, two small jetties, with depths of about 5m2 alongside, project from the shore on its eastern side, and there are quays in its south-eastern corner with depths of about 4m6 alongside.

**Navigational aids.**—Leading lights for approaching the entrance have been established close northward of the harbour. The front light is exhibited, at an elevation of 9m8, from a white rectangular shield with a black vertical stripe, 7m0 in height, situated on Novyy Severnyy mol, near its root; the rear light is exhibited, at an elevation of 15m5, from a similar shield, 13m7 in height, situated about  $3\frac{1}{2}$  cables east-south-eastward of the front light. These lights in line, bearing  $117^{\circ}$ , lead about  $1\frac{1}{2}$  cables northward of the head of Zapadnyy mol and up to the line of the leading lights for the harbour entrance.

Leading lights for entering the harbour are established. The front light is exhibited, at an elevation of 9m5, from a red metal framework tower having a white rectangular daymark with a black stripe, 8m2 in height, situated on the south-western corner of Sredniy mol (*see above*); the rear light is exhibited, at an elevation of 16m2, from a similar structure 14m5 in height, at the root of Yuzhnyy mol, 2 cables south-south-eastward of the front light. The lights in line, bearing  $158^{\circ}$ , lead through the entrance into the harbour.

Two obstructions, with depths of 5m9 and 7m1 over them, lie within half a cable north-north-westward of the head of Zapadnyy mol. A white

*Chart 2247, Plan of Port Poti.*

conical light-and-whistle-buoy, surmounted by a broom, open part down, and exhibiting a *white flashing* light, is moored one cable north-north-westward of the head of the mole.

- 5 Close within the entrance, abreast the head of Novyy Severnyy mol ( $42^{\circ} 09' N.$ ,  $41^{\circ} 39' E.$ ), the channel is marked on its western side by a conical light-buoy, painted black, surmounted by a black broom, open part down, and exhibiting a *white flashing* light *every three seconds*. A shoal with a least depth of 1m7 over it, lies on the western side of the channel.

10 A light is exhibited, at an elevation of 17m0, from a white square metal framework tower, 13m0 in height, situated on the head of Novyy Severnyy mol. A fog signal is sounded from the light-structure.

- A light is exhibited on the head of the spur extending south-south-east-ward from Novyy Severnyy mol.

A light is exhibited, at an elevation of 16m0, from a white metal framework tower 16m0 in height, situated on the head of Zapadnyy mol.

A light is exhibited, at an elevation of 7m0, from a white, metal, framework tower situated on the elbow of Zapadnyy mol.

- 20 Two lights, disposed vertically, are exhibited, at elevations of 13m7 and 11m9, from a concrete column, situated on the head of Severnyy mol.

A light is exhibited, at an elevation of 7m0, from a white octagonal stone tower, 5m0 in height, on the head of the spur extending north-north-eastward from near the head of Severnyy mol.

- 25 **Range of water level.**—The range of water level in the harbour caused by wind amounts to about 0m6. Westerly winds raise, and easterly winds lower the water level, especially in summer.

**Pilotage.—Traffic signals.**—Pilotage is compulsory for merchant vessels entering or leaving the harbour.

- 30 The pilot should be awaited in the outer roadstead. Vessels approaching the port should request the services of a pilot 6 hours before entering the roadstead.

A black cone between two black balls displayed by day, and a *white* light between two *red* lights, disposed vertically, exhibited at night, from

- 35 the storm signal mast at the head of Severnyy mol, denote that the harbour is closed. The absence of any signal denotes that the port is open to shipping. See also pages 14 and 20.

**Directions.**—A vessel approaching Port Poti from north-westward is recommended to make for a position  $8\frac{1}{2}$  miles west-north-westward of the

- 40 harbour entrance, and thence to steer on the alignment of the leading light-structures close northward of the harbour, in line bearing  $117^{\circ}$ . When the leading light-beacons at the southern end of the harbour come into line, bearing  $158^{\circ}$ , the vessel should alter to this alignment, which leads through the harbour entrance.

- 45 A vessel approaching from south-westward should make for a position 5 miles west-south-westward of Potiyskiy lighthouse, and thence should adhere to the alignment of the leading beacons 3 miles northward of the lighthouse, in line bearing  $040^{\circ}$ ; when the northern pair of leading light-beacons come into line, bearing  $117^{\circ}$ , the vessel should alter to this alignment, and proceed as described above.

50 Due to the shoal of 1m7 on the western side of the entrance channel (see above) the leading line on bearing  $158^{\circ}$  must be strictly adhered to.

**Regulations.**—The following are some extracts from the Port regulations in force in 1964. A full copy should be obtained on arrival in

- 55 harbour:—

10. Vessels should notify their time of arrival at Port Poti when they

*Chart 2247, plan of Port Poti.*

leave their previous port and again 48 hours before arrival at Port Poti (42° 09' N., 41° 39' E.), the precise time being confirmed 4 hours before arrival.

12. Vessels anchor in the outer roads until a berth in the harbour is allocated. 5

14. Vessels are prohibited from entering harbour in fog or low visibility.

17. Vessels may only enter or leave the harbour one at a time and then only as directed by the port Captain. Vessels entering harbour give way to those leaving. 10

26. Every vessel entering or leaving harbour must have at least 0m25 of water under the keel at low water.

29. Bilges may not be cleared, nor ballast discharged within 50 miles of Port Poti. 15

57. Vessels must not anchor in the entrance channels.

**Poti.—Port facilities.**—The town of Poti (42° 09' N., 41° 40' E.) is situated on flat, low-lying ground on the banks of the southern branch of Reka Rioni and on Ostrov Bol'shoi. The various parts of the town are connected by bridges over the two branches of the river. Poti is subject to malaria in summer. There is a hospital in the town. 20

Poti is the principal port for transhipment of cargo for or from Central Asia and the Trans-Caspian district, and also for the export of manganese ore from the Caucasian and Chiaturi regions. In 1967, the population was about 42,500. 25

Supplies of coal are available.

Fuel oil may be obtained.

Provisions of all kinds are available. Fresh water is laid on to the quays.

Severnny mol, Sredniy mol and the northern and southern sides of Vnutrenniy basseyn are connected with the general railway system. 30 The quays alongside Severnny mol and the northern side of Vnutrenniy basseyn, which are used for handling manganese ore, were equipped with six 12½-ton electric cranes, and the quay extending southward from the root of Sredniy mol, which is used for embarking grain, was equipped with an elevator and one 3-ton crane. All other quays are used for general cargo. There are five floating cranes available, two of 100 tons, and three of 75 tons capacity. 35

Tugs and lighters are available.

Repairs to hulls and engines can be effected.

There is a signal station on the south-western corner of Sredniy mol. 40

**De-ratting.**—De-ratting can be carried out; see page 27.

**Communications.**—There is regular sea communication with U.S.S.R. Black sea and Sea of Azov ports.

There is a radio station at Poti, see page 26.

**Storm signals.**—Storm signals, see page 18, are displayed from a mast at the head of Severnny mol. 45

*Chart 2263.*

**APPROACHES TO BATUMI.—Northern approach.—Lights.**

**Anchorage.**—From Poti the coast, which is low and covered with trees, trends south-south-eastward for about 4 miles to an opening through which Ozero Paleostomi connects with the Black sea. Reka Pichora flows into Ozero Paleostomi. From this opening the coast trends a further 5 miles south-south-eastward to the mouth of Reka Supsa, and thence 6½ miles southward to the estuary of Reka Namanebi, into which also flows Reka Sharis-Tskali. The village of Shekvitili stands on the northern side 55

*Chart 2263.*

of the estuary. There are numerous buildings and considerable cultivation on this stretch of coast, and the mouth of Reka Namanebi can be identified by the fact that the trees in its vicinity are far less dense than elsewhere.

- 5 Temporary anchorage can be obtained abreast Shekvitili, in depths of 30 to 36 feet (9m1 to 11m0), about 4 cables offshore, but caution is necessary as the bottom shelves rapidly. Small craft with local knowledge can obtain shelter within the estuary of Reka Namanebi. The entrance channel has depths of from about 3 to 4 feet (0m9 to 1m2), but it is tortuous and
- 10 liable to shift.

From the estuary of Reka Namanebi the coast trends southward for  $9\frac{1}{4}$  miles to Mys Tsikhis-Dziri ( $41^{\circ} 45' N.$ ,  $41^{\circ} 44' E.$ ). About midway along this stretch of coast is the town of Kobuleti, a seaside resort which extends for about 3 miles along the coast, and in which is a large, white

- 15 building which is prominent from seaward.

Kobuletskiy light is exhibited, at an elevation of 84 feet (25m6), from a red square metal framework tower carrying a white rectangular daymark with a black stripe on three of its sides, 59 feet (18m0) in height, situated close northward of the town of Kobuleti.

- 20 Mys Tsikhis-Dziri is low but is formed of steep, light-coloured, crumbling rock and stands out well against a background of dark trees. It is the termination of the north-westernmost spur of the mountains of Anadolu (Anatolia), which here recede inland. A prominent white house stands close within the point.

- 25 A rocky bank, with depths of less than 6 feet (1m8) and extending about a quarter of a mile offshore, fringes the coast for  $1\frac{1}{4}$  miles north-north-eastward of Mys Tsikhis-Dziri; for one mile farther north-north-eastward, depths of less than 18 feet (5m5) extend to 4 cables offshore.

*Chart 2236.*

- 30 Gora Kopatavis-Tavi, 2,275 feet (693m4) high, and Gora Tkemlebis (Sakverniya), 2,891 feet (881m2) high, situated, respectively, about 3 miles south-eastward, and 4 miles east-south-eastward of Mys Tsikhis-Dziri, are conspicuous marks.

From Mys Tsikhis-Dziri the coast trends south-south-westward for

- 35 about 4 miles to Mys Kyyalyk (Green cape), which is similar in colour and surroundings to the former point; about midway between these two points, Reka Chakvis enters the sea through Dolina Chakvis-Tskhali (Chakva valley). From Mys Kyyalyk the coast continues south-south-westward for about 2 miles to the mouth of Rechka Koralis-Tskali,
- 40 between which and Mys Burun-Tabiya, about  $1\frac{3}{4}$  miles farther west-south-westward, is the entrance to Batumiyskaya bukhta, which is described on pages 413-415.

**Current.**—After fresh westerly winds, the current off the coast between Poti and Batumi has been found to set strongly onshore.

- 45 **Local Magnetic anomaly.**—A local magnetic anomaly with variations between  $1^{\circ} W.$  and  $19^{\circ} E.$  was reported, in 1964, in the approaches to Batumi.

**South-western approach. — International boundary. — Coast. —**

- Navigational aids.**—The coast south-westward of Sarpi village ( $41^{\circ} 31' N.$ ,  $41^{\circ} 33' E.$ ), near which the International boundary between
- 50 Turkey and U.S.S.R. reaches the coast, is described on page 446.

The scattered village of Guniye, close southward of which is a conspicuous cleft in the coastal cliffs, lies about one mile northward of Sarpi and 8 miles south-south-westward of Mys Burun-Tabiya. Gora Guniye,

- 55 4,800 feet (1,463m0) high lies about 5 miles eastward of Sarpi; it is covered with snow during the greater part of the year and is the best landmark in

*Chart 2236.*

the vicinity. Between Guniye and Mys Burun-Tabiya is Dolina Chorokh, a wide and cultivated valley through which Reka Chorokh enters the sea about  $4\frac{1}{2}$  miles south-westward of the latter point. The mouth of this river can be identified by a large concrete bridge, unfinished in 1938, about three quarters of a mile inland, and by Chorokhskiy light-structure, close north-north-eastward of the river mouth. 5

Chorokhskiy light is exhibited at an elevation of 43 feet (13m1), from a red metal framework tower carrying a white rectangular daymark with a black stripe, 33 feet (10m1) in height, situated close north-north-eastward of the mouth of Reka Chorokh. 10

Guniye light is exhibited on the coast 5 miles south-south-westward of Chorokhskiy light-structure.

There is a conspicuous red and white house near the coast about  $3\frac{1}{2}$  miles south-westward of Mys Burun-Tabiya. 15

The entrance to Reka Chorokh is fringed by a bank which, with depths of less than 33 feet (10m1), extends as much as half a mile off the river mouth; a black and white spar buoy surmounted by two cones, bases together, marks the western edge of the bank. A detached 22-foot (6m7) shoal lies about half a mile northward of the spar buoy. 20

From April to August, when the snow is melting on the mountains, the current in Reka Chorokh is very strong. In the rainy season the water level in the river rises as much as 6 feet above the normal level, causing extensive floods, and the current in its mouth attains a rate of from 6 to 7 knots, making navigation impossible. In consequence of these currents the channel in the river mouth is constantly shifting. There is a ferry across the river mouth. A special type of flat-bottomed boat, drawing not more than one foot (0m3), is used locally for navigating the river, the normal type of boat being unsuitable. 25

Between the mouth of Reka Chorokh and Mys Burun-Tabiya ( $41^{\circ} 39' N.$ ,  $41^{\circ} 38' E.$ ) the coast is fringed by a bank which with depths of less than 33 feet (10m1), extends up to three-quarters of a mile offshore; on this bank there are several patches with depths of from 12 to 18 feet (3m7 to 5m5) about 2 cables offshore. This stretch of coast should be given a berth of at least 2 miles. 35

**Restricted area.**—An area indicated on the chart, in which navigation by all vessels is restricted, extends west-north-westward for a distance of 12 miles from the coast between positions situated about one mile south-south-westward of Chorokhskiy light-structure and the light-structure situated westward of Gora Guniye; see "*LAWS AND REGULATIONS APPERTAINING TO NAVIGATION*" on page 1. This part of the coast is further referred to on page 446. 40

**Wind.**—Strong south-easterly winds blow locally down Dolina Chorokh. They commence about sunrise, with calm weather in the offing and a clear sky, increase in strength until about noon, when they begin to decrease, dying away about 1400. 45

*Chart 2247, plan of Port Batumi.*

**BATUMIYSKAYA BUKHTA.**—**Aspect.**—**Navigational aids.**—The lighted colouring of the cultivated land in the vicinity of the town of Batumi, which lies within Mys Burun-Tabiya, contrasts sharply with the dark forest which covers the hills on either side of the town, so that it stands out well from an offing. See view [47]. 50

When approaching Batumi the following objects are prominent: a ruined castle on Gora Tamara ( $41^{\circ} 39' N.$ ,  $41^{\circ} 41' E.$ ) situated on the southern side of the entrance to Reka Korali-Tskali; a collonade about 55



*Chart 2247, plan of Port Batumi.*

3 cables south-westward of Mys Burun-Tabiya; the cathedral in Batumi and Batumiyskiy light-structure; and the radio masts which stand nearly  $1\frac{1}{2}$  miles south-eastward of the light-structure.

- 5 A large oil refinery is situated within the south-eastern shore of the bay, about  $1\frac{1}{2}$  miles eastward of Mys Burun-Tabiya.

Mys Burun-Tabiya is the termination of a wide, marshy and tree-covered plain, which extends south-south-westward to Reka Chorokh. This point is formed by the gravel deposits brought down by the strong current of Reka Chorokh and is extending. Burun-Tabiyskiy mol, which extends about half a cable north-north-eastward from the north-western extremity of the point, has been constructed to assist in this extension.

- 10 Batumiyskiy light is exhibited, at an elevation of 20 metres, from a white, octagonal, stone tower, 17m5 in height, situated about  $1\frac{1}{2}$  cables south-eastward of Mys Burun-Tabiya. A fog signal is sounded from a building close to, and a radio-beacon transmits from the lighthouse.

- 15 A light is exhibited, at an elevation of 9 metres, from a red framework structure, 7m5 in height, situated on Mys Burun-Tabiya.

**Dangers.—Buoyage.**—Batumiyskaya bukhta is entered between the mouth of Rechka Koralis-Tskali (page 412) and Mys Burun-Tabiya, about 2 miles west-south-westward. The western side of the bay is very steep-to, but its southern and eastern shores are shelving, and from these, a bank, with depths of less than 10m0, extends as much as about one mile offshore. The western edge of this bank lies parallel with, and about

- 25  $3\frac{1}{2}$  cables off the western side of the bay.

A light-and-whistle buoy, painted black and white in stripes and exhibiting a *white flashing* light showing a *short flash every two and a half seconds*, is moored about  $1\frac{1}{2}$  cables north-north-westward of the north-western extremity of the bank; its western side is marked by two black and white spar buoys, each surmounted by two cones, bases together, moored about  $1\frac{1}{2}$  and 3 cables, respectively, southward of the light-buoy; and its north-western extremity is marked by a white spar buoy surmounted by a black cone, point up, moored about  $1\frac{1}{2}$  cables south-south-eastward of the light-buoy.

- 35 Three patches of foul ground are charted between  $1\frac{1}{2}$  and  $2\frac{1}{2}$  cables south-eastward of Batumiyskiy light. ( $41^{\circ} 39' N.$ ,  $41^{\circ} 38' E.$ )

**Batumiyskiy reyd.—Lights.—Anchorage.**—Batumiyskiy reyd comprises the area between the western side of Batumiyskaya bukhta and the extensive bank described above, it is open northward and north-eastward.

- 40 Leading lights have been established for entering Batumiyskiy reyd. The front light is exhibited, at an elevation of 13 metres, from a white, round metal tower, 11m3 in height, situated on the head of Neftyanoy mol, about  $6\frac{1}{2}$  cables south-south-eastward of Mys Burun-Tabiya; the rear light is exhibited, at an elevation of 40 metres, from a white, pyramidal, stone beacon, 5m5 in height, situated about 7 cables southward of the front light. These lights in line bearing  $172\frac{1}{2}^{\circ}$ , lead into Batumiyskiy reyd, passing westward of the light-and-whistle buoy and spar buoys.

- 50 Batumiyskiy reyd is not a good anchorage on account of the considerable depths therein, which, on the western side of the road, are upwards of 40m0 at one cable from the shore, deepening rapidly to 55m0 and 65m0, except in the restricted southern part of the road, where the depths are under 36m0.

- 55 Vessels anchor near the western shore abreast the town, in a depth of about 55m0, and secure their sterns to bollards ashore by means of

*Chart 2247, plan of Port Batumi.*

hawsters. The space is very limited, and when anchoring, care is necessary to avoid fouling the anchors of other vessels.

An anchorage area, indicated on the chart, is established with its centre  $8\frac{1}{2}$  cables north-eastward of Mys Burun-Tabiya. 5

There are a number of mooring buoys in the roads.

**Port Batumi.—Basins.—Quayage and depths.**—Port Batumi comprises two basins, named Neftyanaya gavan' and Kabotazhnaya gavan', and the western side of Batumiyskaya bukhta.

The whole of the western shore of the bay consists of a natural quay 10 or esplanade. On this shore there is a quay, alongside which there are depths of 7m2; there are two berths here, one of which is 170 metres long. There are also a number of piers, with depths of from 6m0 to 9m0 alongside them, and several smaller piers with depths of up to 3m0 along-side. These piers are mainly used by coasting vessels. Large vessels 15 secure here only in extreme cases.

Neftyanaya gavan' ( $41^{\circ} 38' \cdot 5$  N.,  $41^{\circ} 38' \cdot 5$  E.), which lies in the south-western corner of Batumiyskaya bukhta, is protected by Neftyanoy mol, which extends about  $2\frac{1}{2}$  cables in a northerly direction from the southern shore of the bay and thence about 3 cables in a westerly direction. The 20 whole of this basin is lined with masonry quays. There are five oiling berths alongside Neftyanoy mol; in 1966, four of these could accommodate vessels with a maximum draught of 8m5, and the fifth a vessel with a draught of 9m3. On the southern side of the basin there are five general cargo berths with depths of 8m0 alongside. 25

A mooring buoy lies about  $1\frac{1}{4}$  cables south-westward of Neftyanoy Mol light-structure; there are two mooring buoys  $1\frac{1}{2}$  cables westward of the light-structure.

Kabotazhnaya gavan', or Coaster harbour, lies south-eastward of Zashitnyy (Protecting) mol, which extends about  $1\frac{1}{2}$  cables east-north-eastward from the elbow of Neftyanoy mol. This harbour is silting 30 up.

**Pilotage.**—Pilotage is compulsory for merchant vessels entering or leaving the harbour, or shifting berth within it. Pilots board vessels in the outer roads near the position of the light-and-whistle-buoy, during good 35 weather, and in the inner roads during bad weather.

Vessels proposing to visit Batumi must announce their intention to the port authorities 48 hours beforehand, and again 24 hours before their expected time of arrival; 4 hours before arrival vessels must signal the precise time of doing so and request the services of a pilot. 40

**Regulations.**—The following are extracts from the regulations which were in force in 1964, for the Port of Batumi ( $41^{\circ} 39'$  N.,  $41^{\circ} 39'$  E.). Copies of the full regulations should be obtained on arrival. See also page 15.

12. Vessels entering harbour must give way to vessels leaving harbour. 45

17. All oil tankers arriving at Batumi, and throughout their stay in the harbour, must display flag "B" of the International Code by day, and exhibit a red light in a conspicuous position at night.

22. All boilers and galley funnels, and exhaust pipes of motor vessels, of vessels lying in Neftyanaya gavan' are to be cleared of soot before 50 arrival in the harbour, and are to be fitted with proper spark catchers.

27. All vessels must have at least 0m3 of water under their keel at low water before entering or leaving harbour.

47. Only one vessel may enter or leave harbour at a time.

Every oil tanker arriving in the harbour, even if only partly laden, 55 is to have her double bottoms filled with water.

*Chart 2247, plan of Port Batumi.*

All vessels must berth head towards the entrance or seaward, with an anchor laid out by which to haul off.

- When securing in Neftyanaya gavan', masters of vessels must see that a  
 5 joining shackle of the offshore anchor is so placed on deck that the cable can be slipped in case of fire or other emergency.

During the vessel's stay in harbour efficient rat guards must be fitted to all shore fasts.

- All oil tankers, as soon as laden or emptied, must haul off and anchor in  
 10 the roadstead.

Oiling berths are for the sole use of tankers loading or discharging. No vessel is allowed to occupy such a berth while waiting for such operations, for purposes of repair, or for any other needs.

- Tankers laden with certain oil products are not in any circumstances  
 15 to be berthed alongside another vessel. When no berth is available, such a vessel must anchor in the road well clear of the usual track of shipping entering or leaving the harbour.

- While discharging or loading oil products by pumps all hatches and ventilators must be hermetically sealed. Any openings left for loading  
 20 cargo or for other purposes must be covered with wire netting or wetted woollen material.

On completion of loading or discharging, all oil intakes, except ventilators, are to be hermetically sealed.

- No fires, except those in boiler rooms or galleys, are allowed on board  
 25 any vessel laden with oil products in bulk, other inflammable liquids, or explosives, when lying alongside a pier or quay.

**Winds.—Caution.**—In the approaches to Port Batumi and in the port area the predominant wind is south-westerly. Northerly winds are frequent in summer. Land and sea breezes prevail in spring and summer.

- Storms are not frequent, but where they do occur it is usually between  
 30 October and May, and usually with south-westerly winds. During such winds there is much swell in the bay.

The "Tyagun" (see also page 393) may occur with westerly, south-westerly or north-westerly winds, when the turbulent sea and swell meet.

- All precautions should be taken if a Tyagun is likely, and vessels should haul  
 35 off or proceed to sea.

*Charts 2247, plan of Port Batumi; 2236.*

- Current.**—The outflow of Reka Chorokh sets in a west-north-westerly direction, at a rate of from one to  $1\frac{1}{2}$  knots, for about 4 miles offshore,  
 40 whence it turns north-north-eastward parallel to the coast. Eddies from this current set inshore between Kabotzahnaya gavan' at Batumi and Kobuleti ( $41^{\circ} 49' N.$ ,  $41^{\circ} 44' E.$ ) (page 412), turning south-westward close inshore, with a rate of about one-third of a knot. Thence an eddy, about 4 cables wide, sets along the shore past Port Batumi and round Mys  
 45 Burun-Tabiya and then merges into the main current. See also page 50.

- Directions.**—During foggy weather, vessels are recommended to approach Batumiyskaya bukhta from south-westward, as the coast is high and bold, and the lower parts of the mountains can be seen when the summits are hidden. The muddy outflow of Reka Chorokh also affords  
 50 a good means of identifying the position.

In the approach from northward, on the contrary, the coast is flat and the fog lies low.

*Chart 2247, plan of Port Batumi.*

- Batumi.—Port facilities.**—The town of Batumi ( $41^{\circ} 39' K.$ ,  $41^{\circ} 38' E.$ )  
 55 lies within the western shore of Batumiyskaya bukhta. It is the centre of local administration and is one of the most important of the U.S.S.R.

**Chart 2247, plan of Port Batumi.**

**Black sea ports.** It is the shipping port for the products of the Baku and Caucasian oilfields. *See* page 8. There is a hospital in the town. In 1967, the population of Batumi was about 100,000; the town is subject to malaria. 5

The principal exports consist of oil products, timber, fruit and grain, and the chief imports are pig iron and metal, machinery and tools.

No coal is available. Unlimited quantities of fuel oil can be supplied; six vessels can be supplied simultaneously at a rate of 150 tons per hour.

Fresh provisions are plentiful. Fresh water is laid on to the moles and 10 quays.

The Harbour Authorities undertake small repairs to hull and machinery. There are six 8-ton travelling cranes on the quays. There is one steam tug, fitted with fire-fighting appliances.

All quays in Neftyanaya gavan' are connected with the general railway 15 system.

**De-ratting.**—De-ratting can be carried out, *see* page 27.

**Communications.**—There is regular sea communication with all U.S.S.R. Black sea ports.

There is a radio station at Batumi, *see* page 26. 20

**Storm signals.**—Storm signals, *see* page 18 are displayed from a mast on the western side of the bay, about 2 cables southward of Mys Burun-Tabiya ( $41^{\circ} 39' N.$ ,  $41^{\circ} 38' E.$ ). This mast is also used for signalling to shipping.

**Life-saving station.**—There is a life-saving station, equipped with 25 a motor lifeboat, in the port.

**Climatic table.**—*See* page 82.

## CHAPTER XI

COAST OF ANADOLU OR SOUTHERN SHORE OF BLACK SEA:  
SİLE BURNU TO U.S.S.R./TURKISH FRONTIER

*Charts 2238, 2237, 2236.*

**COAST OF ANADOLU.** — **General remarks.** — **Aspect.** — The southern shore of the Black sea trends in a general easterly direction from the northern entrance of the Bosphorus for about 570 miles to the U.S.S.R.-Turkish frontier.

There are two well-marked regions: the coastal belt, which rises steeply from the sea and is thickly forested and rainy, especially in the east; and the inland belt, which is somewhat cut off from the rains by the coastal range and is traversed by deep valleys. The high land of the latter belt is composed mainly of worn plateau blocks standing up as mountains, and is surmounted, in places, by extensive lava piles from extinct volcanoes; much of it is covered with pine forest and scrub, but there are also patches of bare rock, pasture, and sub-tropical forest. The difference between the two belts is more marked in the east, where high mountains lie between the wet coast and the more arid hinterland; but in the west, where altitudes are lower, the difference is less marked and the change more gradual.

Between Ereğli ( $41^{\circ} 18' N.$ ,  $31^{\circ} 27' E.$ ) and İnebolu ( $41^{\circ} 59' N.$ ,  $33^{\circ} 45' E.$ ) the coastal belt differs from the remainder and consists of wide, parallel valleys and wooded hills.

The whole of this coast is subject to severe earthquakes.

This coast is almost devoid of ports or harbours, and those that exist are widely separated and would offer no security to shipping were it not for the fact that the mountains neutralize the effect of onshore winds, which do not blow home. Owing to this, several anchorages afford shelter from such winds, although they do not have a tempting appearance. Too much reliance must not, however, be placed on these remarks, as in certain localities the shelter afforded by the mountains is far from being so good as in others. The most violent winds on this coast are those from westward.

The following are the most prominent mountains near this coast:— Alemdar (Alam dar) and Çatal dağ ( $41^{\circ} 02' N.$ ,  $29^{\circ} 18' E.$ ), near the Bosphorus, *see* page 163; Ağva dağ and Baba dağı, described on page 420, about  $26\frac{1}{2}$  and  $41\frac{1}{2}$  miles, respectively, eastward of Çatal dağ; Mount Kirpen, about 5 miles north-eastward of Baba dağı; Kizil tepesi, 4,728 feet (1441m) high, about 57 miles eastward of Mount Kirpen; Kapı (Kapu) dağı and Gebeoğlu tepesi, which form a series of conical, coastal hills between Amasra ( $41^{\circ} 45' N.$ ,  $32^{\circ} 25' E.$ ) and Kerempe burnu, about 42 miles east-north-eastward, with bright patches along the coast; the mountains within Sinop, about 83 miles eastward of Kerempe burnu; Tütmen tepesi (Katran dağ) and Kocadağ (Nabien dağ), described on page 432, about 40 miles south-south-eastward, and 55 miles south-eastward, respectively, of Sinop; and Çal dağ, about 115 miles east-south-eastward of Kocadağ, and Sis dağı, about 34 miles farther east-north-eastward. described on pages 436 and 437.

*Charts 2238, 2237, 2236.*

Between Trabzon, about 30 miles east-north-eastward of Sis dağı, and Hopa, about 77 miles farther east-north-eastward, the coast is backed by a prominent snow-covered range with many sharp peaks. Ayana tepesi and Mount İohannis, described on page 444, about 33 miles eastward of Trabzon, are good marks. 5

**Harbours.**—Large vessels may obtain safe anchorage in all weathers in the northern part of Ereğli limanı and at Sinop, and there are berths for these vessels in the artificial harbours of Zonguldak, Samsun, Giresun and Trabzon. 10

Amasra, İnebolu, Gerze, Unye, Fatsa, Persembe (Vona), Tirebolu, Akçaabat (Polathane) and Rize afford shelter for smaller vessels under certain conditions of weather: *see* under the descriptions of these harbours. *See* also Appendix No. II.

**Winds.**—On this mountainous coast the prevalent directions of coastal winds vary from place to place and with the time of day. Westward of Kerempe burnu ( $42^{\circ} 02' N.$ ,  $33^{\circ} 17' E.$ ) northerly winds are normally the strongest and the most dangerous, but north-easterly winds may raise an unpleasant short, steep, sea. In the vicinity of Batumi south-westerly winds blow strongly; in winter they have occasionally reached hurricane strength and even in spring and summer have sometimes exceeded 29 knots; *see* Climatic table for Batumi, page 82. 15 20

From 20 to 30 miles offshore between the entrance to the Bosphorus and Kerempe burnu, the prevailing winds are north-easterly to northerly, and farther eastward, from between north-west and north-east. In both regions, however, there are winds from south or south-east which veer to west or north-west and may blow strongly when a depression moves eastward across the Black sea. 25

*Chart 2238.*

**SİLE BURNU TO EREĞLİ.**—Sile burnu to Pararhasi burnu.—**Dangers.**—**Anchorage.**—**Lights.**—From Sile burnu (page 165), the coast trends east-south-eastward for about 11 miles to the village of Ağva ( $41^{\circ} 09' N.$ ,  $29^{\circ} 51' E.$ ) which is situated at the mouth of Koca dere. *See* view [1]. 30

Çanak burnu light is exhibited, at an elevation of 56 feet (17m1), from a concrete tower 13 feet (4m0) in height, at Ağva. 35

Seyrek (Sirek) limanı is entered on the eastern side of Palamar (Bozuk Kale) burnu, about 11 miles eastward of Ağva. This bay is used by small craft with local knowledge which are hauled up on the beach to protect them from the surf. 40

Kadırga adası, a small islet, 6 feet (1m8) high, lies about  $2\frac{1}{2}$  miles eastward of Palamar burnu and about  $4\frac{1}{2}$  cables offshore. There are depths of from 36 to 54 feet (11m0 to 16m5) in the passage between this islet and the mainland. 45

Kerpe limanı and Kefken limanı are entered on the western and eastern sides, respectively, of Kerpe burnu, a bold headland situated about  $4\frac{1}{2}$  miles east-north-eastward of Palamar burnu. Kerpe limanı is much to be preferred to Kefken limanı, and affords anchorage, sheltered from all but westerly and north-westerly winds in a depth of 24 feet (7m3). Vessels entering this bay should give the eastern entrance point a wide berth in order to avoid a number of above-water rocks which lie off the southern side of that point. Kefken limanı has depths of from 18 to 24 feet (5m5 to 7m3) and affords shelter from northward and eastward in its northern part; small craft can also find shelter from westerly winds within its low, south western entrance point. Anchorage can be obtained off the 50 55

*Chart 2238.*

village, in a depth of 15 feet (4m6), sand, about  $1\frac{1}{2}$  cables offshore. Local knowledge is necessary to enter these two bays.

About  $1\frac{1}{2}$  miles north-eastward of Kerpe burnu there is an inlet known as False Kefken; it is encumbered with reefs and is not used.

Another bay, on the shore of which is Cebeci iskele, is entered between the north-eastern entrance point of False Kefken and Pazarhaşı (Kovuk Kaya) burnu, about 2 miles east-north-eastward. An above-water rock lies a short distance eastward of the south-western entrance point of this bay, and Kefken shoal, with depths of less than 6 feet (1m8) over it, lies about 5 cables east-north-eastward of the same point and about 2 cables offshore.

Kefken adası, which is low, lies about 2 cables northward of Pazarhaşı burnu ( $41^{\circ} 13' N.$ ,  $30^{\circ} 17' E.$ ); there are remains of an old fort on the island and several above-water rocks lie close off its northern and western sides. Pazarhaşı burnu is bordered by white cliffs; a spit extends a short distance off the point and a similar spit extends from Kefken adası. There is a channel with depths of 20 feet (6m1) between the island and the point, but it should not be used without local knowledge. Foul ground extends about  $1\frac{1}{2}$  cables westward from Kefken adası. See view [48].

There is a small harbour, protected by two breakwaters, on the southern side of Kefken adası; there are depths of 20 feet (6m1) in the outer part of the harbour, but the inner part is shoal.

Kefken adası light is exhibited at an elevation of 79 feet (24m1), from a white metal column and dwelling, 33 feet (10m1) in height, situated on Kefken adası. A fog signal is sounded and a radiobeacon transmits from the lighthouse; red fixed obstruction lights are exhibited on the radio mast.

A red light is exhibited on the head of each breakwater.

Anchorage, sheltered from northerly and easterly winds by Kefken adası and the above-mentioned spits, can be obtained in depths of from 6 to 7 fathoms (11m0 to 12m8), a short distance westward of Pazarhaşı burnu, the bottom is rocky in places. Except for the foul ground extending westward from Kefken adası, this island and Pazarhaşı burnu may be safely approached.

**Aspect.**—From a position about 10 miles northward of Kefken adası, the following objects may be seen in clear weather: Ağva dağı, a high, peaked mountain about 21 miles south-westward of the island; the two peaks of Baba dağı, about  $6\frac{1}{2}$  miles south-westward of the island, which are about 700 feet (213m4) high and covered with trees; an isolated peak, about 30 miles inland, seen nearly over Baba dağı; and Kefken adası lighthouse. These marks should serve to identify the vicinity, which is stated, by some mariners, to resemble the northern approach to the Bosphorus.

**Life-saving.**—A lifeboat is stationed at Kefken adası and there is a line-throwing apparatus at Cebeci iskele, close westward. See page 25 and for identification marks, see page 164.

*Charts 2238, 2278.*

**Pazarhasi burnu to Deliktaş burnu.—Coast.—Anchorages.—**

**Lights.—Fog. signal.**—Between Pazarhaşı burnu and Baba burnu ( $41^{\circ} 18' N.$ ,  $31^{\circ} 26' E.$ ), about 51 miles eastward, there is a large bight into which flow several rivers, one of which, Gülünçirmacı about  $2\frac{1}{2}$  miles southward of Baba burnu, has a sandy beach at its mouth.

Between Pazarhaşı burnu and Dikili (Deliklikaya) burnu, about  $2\frac{1}{2}$  miles east-south-eastward, the coast is fringed by rocks, thence to Melenagzı, the mouth of Melen deresi, about 28 miles farther east-south-eastward, it is low and fronted by a beach. Near Deliklikaya burnu the hills approach the coast but westward of that point, they recede inland.

*Chart 2238, 2278.*

Sakarya ağzi flows into the bight about  $15\frac{1}{2}$  miles east-south-eastward of Dikili burnu. There are depths of from 3 to 5 feet (0m9 to 1m5) over the bar, within which, for about 8 miles, the river has depths of 18 feet (5m5) and an average width of about half a cable. The current in the river is rapid and discolours the water for some distance seaward. The masts of small craft within the bar are visible from the offing. In the village of Karasu, about  $2\frac{1}{2}$  miles south-eastward of the mouth of the river, there is a mosque which helps to identify the locality. Vessels calling here for timber anchor in a depth of about 60 feet (18m3), mud.

A light is exhibited, at an elevation of 31 feet (9m4), from a metal tripod on a concrete base, 28 feet (8m5) in height, situated at the mouth of Sakarya ağzi.

*Chart 2278.*

Between Melenagzi and Baba burnu the coast rises in wooded slopes; the river valley can be identified from westward by the fact that the hills slope gradually on that side of it, whilst on its eastern side they rise abruptly.

The town of Akçakoca ( $41^{\circ} 05' N.$ ,  $31^{\circ} 07' E.$ ), lies near the mouth of a river about 18 miles south-westward of Baba burnu. Vessels shipping timber anchor in a depth of 60 feet (18m3), sand, about one mile off the eastern part of the town; this anchorage is exposed to all onshore winds.

Baba burnu is the south-western extremity of a broad headland which is faced by rocky cliffs and is rendered remarkable by the sudden change in the aspect of the coast northward of it. See views [49], [50]. Deliktaş burnu, about one mile northward of Baba burnu is the north-western extremity of this headland. Ölüce light is exhibited, at an elevation of 256 feet (78m0), from a white tower, 30 feet (9m1) in height, situated about half a mile north-north-eastward of Deliktaş burnu. A fog signal is sounded from Ölüce light-structure.

*Chart 1986, plan of Ereğli.*

**EREGLI LIMANI.—Navigational aids.—Dangers.**—Ereğli limanı is entered between Baba burnu and Çengel burnu ( $41^{\circ} 15' N.$ ,  $31^{\circ} 24' E.$ ), about  $2\frac{1}{2}$  miles south-south-eastward. It is spacious and provides the nearest anchorage to the Bosphorus in which large vessels can obtain shelter. See view [49].

A tower stands on Çeş tepe about 5 cables northward of Baba burnu.

A breakwater extends about  $4\frac{1}{2}$  cables south-south-eastward from the coast about  $1\frac{3}{4}$  cables eastward of Baba burnu, eastward of this breakwater, vessels not exceeding 36 feet (11m0) in draught can obtain anchorage sheltered from all winds.

A stranded wreck lies in the cove about one cable eastward of Baba burnu.

A line of mooring buoys, the buoys about half a cable apart, providing sternfasts for vessels securing to the breakwater, is laid about one cable off its landward side.

The northern and eastern sides of the harbour are quayed from the root of the breakwater to the root of the old mole. The remains of an old mole, now used as a breakwater, extends about  $1\frac{1}{2}$  cables south-south-westward from a position about  $7\frac{3}{4}$  cables east-south-eastward of Baba burnu. A submerged portion of this old mole, with a depth of 4 feet (1m2) over it, extends for about three-quarters of a cable farther south-westward.

A light is exhibited at an elevation of 16 feet (4m9) from a structure on a concrete base situated on the head of the old mole. The coal wharf on the



*Chart 1986, plan of Ereğli.*

northern side of the harbour has depths of 21 to 24 feet (6m4 to 7m3) alongside, decreasing to less than 18 feet (5m5) at its eastern end.

- The entrance to Uzunkum harbour is situated about 8½ cables south-eastward of the head of the northern breakwater. It is formed by a mole extending north-westward and northward for about 7 cables, from a position about 13 cables south-eastward of the head of the northern breakwater. The northern side of this harbour is protected by a mole extending westward for about 2 cables, the head of which lies about 2½ cables south-eastward of the head of the outer mole. There are depths of 24 to 30 feet (7m3 to 9m1) alongside the eastern side of the outer mole, decreasing to less than 18 feet (5m5) near its root. In the eastern part of the harbour there are depths of less than 18 feet (8m5).

- Ereğli light (41° 17' N., 31° 26' E.) is exhibited, at an elevation of 28 feet (8m5), from a white, concrete tower situated on the head of the northern breakwater. A fog signal is sounded from the lighthouse.

A light is exhibited, at an elevation of 37 feet (11m3), from a concrete tower on a white hexagonal building, 20 feet (6m1) in height and fitted with a radar reflector, on the head of Uzunkum Harbour Outer mole.

- A light is exhibited, at an elevation of 24 feet (7m3), from a similar structure, 12 feet (3m7) in height, on the head of Uzunkum Inner mole.

**Regulations.**—Similar regulations to those for Karabiga, *see* page 110, are in force for Ereğli.

- Harbour limits.**—**Anchorage.**—Ereğli outer harbour comprises the sea area between a line drawn southward for 2½ miles from Baba burnu and thence eastward to Çengel burnu and a line drawn south-eastward from the northern breakwater head to the head of Uzunkum Harbour Outer mole; the inner harbour lies eastward of the inner of these two limits. These limits are indicated on the plan.

- Vessels may anchor in the outer harbour as convenient, but must do so in such a manner as not to interfere with the free traffic of vessels entering or leaving the inner harbour. Permission from the harbour authorities is necessary for vessels proposing to enter the inner harbour.

- Vessels exceeding 500 tons, if of suitable draught, can berth in the inner harbour, moored between bollards on the northern breakwater and the mooring buoys eastward of it. Anchorage is also possible here, subject to permission. Passenger vessels, when conditions allow, may berth alongside the northern quay extending eastward from the root of the northern breakwater.

- Vessels of less than 500 tons may anchor in the north-eastern part of the inner harbour, and there are quays there at which they may berth.

Vessels carrying explosives or other inflammable material may anchor in the outer harbour but only as instructed by the harbour authorities.

- Vessels loading or unloading cargoes for the iron and steel works use Uzunkum harbour. Vessels with inflammable or explosive cargoes for the iron and steel works only use the same harbour; *see* page 2.

- Pilotage.**—**Tugs.**—**Signals.**—Pilotage is not compulsory, except for vessels exceeding 500 tons entering the inner harbour; the pilot is embarked in the outer harbour. Vessels exceeding 1,000 tons must also employ at least one tug if entering the inner harbour. The usual pilotage signals are required.

**Traffic signals.**—Traffic signals are displayed from a signal mast situated on the northern breakwater (41° 17' N., 31° 24' E.). They have the following significance:—

- Two black balls by day, or two red lights at night, disposed vertically . . . . . Harbour closed

*Chart 1896, plan of Ereğli.*

- Two black cones, points up, by day, or two  
*green* lights at night, disposed vertically . Harbour open.
- A black ball over a black cone point up, by day  
 or a *red* light over a *green* light . Do not attempt to enter. 5
- A black cone point up over a black ball, by day,  
 or a *green* light over a *red* light, at night . No tug available.
- A black ball between two black cones points up  
 by day, or a *red* light between two *green*  
 lights, disposed vertically . Wait. You will be 10  
 piloted into the harbour.
- Three black balls by day, or three *red* lights at  
 night, disposed vertically . Because of unfavourable  
 weather, you cannot be  
 piloted into the harbour. 15

**Ereğli.—Port facilities.**—The town of Ereğli stands on the north-eastern shore of the bay, about 7 cables eastward of the head of the breakwater. It is enclosed on three sides by an ancient wall and on its eastern side is an inaccessible cliff. The best landing place is near the Custom house, close to the southern end of the town. 20

Fresh water and coal are available.

The coal wharf is connected with the general railway system.

*Chart 2278.***DELIKTAŞ BURNU TO BALKAYA BURNU —Coast.—Anchorage.**

—**Navigational aids.**—From Deliktaş burnu the coast trends east-north-eastward for about 17½ miles to Alesso burnu and is hilly, wooded, and intersected by numerous ravines. The coast is generally steep-to, but for 4 miles east-north-eastward of Ölüce burnu, and between Alacaagzı burnu and Asar burnu, 6½ and 9½ miles, respectively, east-north-eastward of Ölüce burnu, sunken rocks extend up to 3 cables offshore in places. 25  
 30

*Chart 2238, plan of Kozlu limanı.*

Kozlu limanı is entered between Alesso burnu and Domuz burnu (41° 28' N., 31° 47' E.), about 1½ miles north-eastward. The bay can best be distinguished by a number of houses at the mouth of a valley in its south-western part, about half a mile eastward of Alesso burnu. There are 35  
 no good landmarks in the vicinity, the coast being backed generally by high, forest-covered mountains. There is a small pier from which coal is shipped into lighters. A mooring buoy is moored about half a mile east-north-eastward of Alesso burnu and about 1½ cables offshore.

The roadstead off the bay is open from west-south-west, through 40  
 north, to east-north-east, but in summer, anchorage may be obtained in convenient depths, the bottom being sand in depths of less than 12 fathoms (21m9), and mud and sand in greater depths. Vessels calling at Kozlu limanı for coal after May, previous to which the weather may be stormy, anchor north-eastward of the valley in the southern part of the bay, as the wind is then generally from eastward of north-east. The 45  
 western extremity of the coast between Ölüce lighthouse and Alesso burnu kept open northward of the latter point, will lead to a good berth about a quarter of a mile offshore, but, to expedite the embarkation of coal, a berth may be found closer inshore. 50

*Chart 2278.*

Balkaya burnu light is exhibited, at an elevation of 135 feet (41m1), from a white iron post on a building, 21 feet (6m4) in height, situated 6 cables north-eastward of Domuz burnu. A fog signal is sounded here.

*Chart 1987, plan of Zonguldak.*

**ZONGULDAK LIMANI.—Anchorage.—Light.**—Zonguldak limani is entered south-westward of Zonguldak burnu ( $41^{\circ} 28' N.$ ,  $31^{\circ} 49' E.$ ), about  $1\frac{1}{2}$  miles east-north-eastward of Domuz burnu. It is open north-ward and westward, but during offshore winds, afford moderately good anchorage, in depths of about 13 fathoms (23m8), sand and mud. Though sheltered from eastward, it is unsafe for shipping during bad weather with winds from north-east, through north, to west. The holding ground is reported to be poor.

- 10 The port and town of Zonguldak are situated on the eastern side of the bay. The most prominent marks in the approach are a radio mast on a hill above the town, and a minaret and a tall stone chimney on the southern side of the bay.

Zonguldak light is exhibited, at an elevation of 174 feet (53m0), from a white, stone tower 30 feet (9m1) in height, situated on Zonguldak burnu. See view [51].

**Zonguldak harbour. — Breakwaters. — Lights. — Depths. —** Zonguldak harbour is a small artificial harbour protected by two breakwaters. The northern breakwater extends about  $1\frac{1}{2}$  cables south-westward from the eastern shore of the bay about 2 cables southward of Zonguldak burnu, and thence west-south-westward for a further  $2\frac{1}{2}$  cables. The western breakwater extends about 2 cables north-north-eastward from the southern shore of the bay, leaving an entrance about one cable wide between the heads of the two breakwaters.

- 25 A light is exhibited, at an elevation of 61 feet (18m6), from the head of the northern breakwater. A fog signal is sounded from a concrete building near the light structure.

A light is exhibited, at an elevation of 51 feet (15m5) from the head of the western breakwater.

- 30 Two blue fixed leading lights situated on the eastern side of the harbour, in line bearing  $080\frac{1}{2}^{\circ}$  lead between the breakwaters.

Owing to silt brought down by Uzulmez dere which flows into the south-eastern corner of the harbour, constant dredging is necessary.

- Quays**—The Coal quay is about 1,650 feet (502m9) long, with depths alongside of 33 feet (10m1), except for about 250 feet (76m2) at its eastern end, which has depths alongside of 23 feet (7m0), but in 1965, depths of 28 feet (8m5) were reported alongside Coal quay and Cargo quay.

- There are two coaling berths for small craft alongside the inner arm of the northern breakwater, with depths alongside of 23 feet (7m0). Coaling is practicable at all seasons.

**Regulations.**—Similar regulations to those for Karabiga, see 110, are in force for Zonguldak.

- Harbour limits.—Anchorages.—Prohibited anchorage.**—Zonguldak town harbour comprises the sea area southward of a line drawn in a  $236^{\circ}$  direction to the shore from a position situated 984 feet (300m0) northward of Zonguldak light-structure. The town harbour is divided into two parts, outer and inner. The outer harbour comprises the area between the  $236^{\circ}$  limit referred to above and a line joining the heads of the two breakwaters; the inner harbour is the area within the line joining the heads of the two breakwaters.

General anchorage is obtainable in the outer harbour within the limits above defined; the anchorage for vessels carrying explosives lies within this area but eastward of a line drawn northward from the northern breakwater head.

- 55 In order to avoid obstructing vessels entering or leaving the harbour,

*Chart 1987, plan of Zonguldak.*

anchoring is prohibited within  $7\frac{1}{2}$  cables westward and west-north-westward of the harbour entrance.

**Pilotage.**—The coaling company sends out a boat with a competent pilot to a vessel on arrival, who will berth her at the quay or conduct her to an anchorage where coaling can be carried out. 5

Pilotage is compulsory for merchant vessels of over 150 gross tons, and for naval vessels and auxiliaries of over 500 tons displacement. Merchant vessels of over 500 tons gross must employ one tug and, if over 5,000 tons, two tugs. 10

**Signals.**—**Signal station.**—A vessel about to enter the harbour must, as soon as she is sufficiently near to be seen, display flag "F" of the International Code of Signals at the masthead and, when closer in, must sound *two long* blasts followed by *one short* blast on the siren.

The signal for requesting a boat to drop the pilot is *one long* followed by *one short* blast on the siren. 15

A signal station is situated on the elbow of the northern breakwater.

**Traffic signals.**—Traffic signals are displayed at the signal station. See traffic signals on page 422 which are identical.

**Zonguldak.** — **Port facilities.** — The town of Zonguldak ( $41^{\circ} 27' N.$ ,  $31^{\circ} 47' E.$ ) is the seat of local government and is the most important port on the western part of the coast of Anadolu. It is an open port, see page 10, and is the principal coal exporting port for the Ereğli coalfield. In the 1965 census, the population was 60,900. 20

Large stocks of coal are maintained. 25

The town supply of fresh water is plentiful

The quays are equipped with cranes, the largest of which is of 15 tons capacity. There is a floating sheerlegs of 60 tons capacity.

There are three tugs and several lighters available in the port.

There are three hospitals. 30

Minor repairs can be carried out.

**Communications.**—The town is connected with the general railway system.

A ferry connects Zonguldak with Istanbul about every four days.

**De-ratting.**—De-ratisation certificates can be issued at Zonguldak. 35

**Climatic table.**—Climatic table for Zonguldak, see page 84.

*Chart 2278.*

**ZONGULDAK TO AMASRA.**—**Coast.**—**Navigational aids.**—Between Zonguldak burnu ( $41^{\circ} 28' N.$ ,  $31^{\circ} 47' E.$ ) and Kilimi burnu,  $2\frac{1}{2}$  miles north-eastward, and thence for about 10 miles east-north-eastward to Hisar burnu ( $41^{\circ} 34' N.$ ,  $32^{\circ} 02' E.$ ), the coast is backed by a number of sharply-pointed hills which decrease gradually in elevation eastward. 40

Hisar burnu is a low point with reddish-coloured slopes, and for 3 miles south-westward of the point the coast recedes into a slight bight. A bank, with a depth of 9 feet (2m7) over it, extends 2 cables offshore near the western end of the bight, and at its north-eastern end, within three-quarters of a mile of Hisar burnu, a rocky bank extends about 2 cables off-shore. 45

Filyos light is exhibited at, an elevation of 28 feet (8m5), from a white column on the head of a pier, about one mile south-westward of Hisar burnu. 50

Between Hisar burnu and Güzelcehisar burnu, a small projection about  $7\frac{1}{2}$  miles east-north-eastward, there is a beach about 6 miles long with no off-lying dangers. In fine weather, temporary anchorage may be obtain-

*Chart 2278.*

ed, in a depth of about 15 fathoms (27m4), about 1½ miles north-eastward of Hisar burnu and about one mile offshore.

- 5 Filyos çayı, which enters the sea by two channels a short distance eastward of Hisar burnu, has depths of from 6 to 7 feet (1m8 to 2m1) in its eastern entrance, and these depths extend about 3 cables upstream. The western channel has lesser depths. This river can only be entered by small craft with local knowledge.

- Bartın limanı.**—Bartın çayı flows into the sea close north-eastward of Demirli burnu (41° 41' N., 32° 13' E.), 3½ miles north-eastward of Güzelcehisar burnu. There are depths of 18 feet (5m5) near the shore, and of about 5 feet (1m5) over the sand bar at the mouth of this river, the channel over the bar being narrowed by rocks on both sides. The river is from 175 to 350 feet (53m3 to 106m7) wide. The greatest depth  
15 over the bar, without rains and when the current is imperceptible, is about 6 feet (1m8); within the entrance the depths increase to from 24 to 30 feet (7m3 to 9m1). The river can be entered by small craft, with local knowledge.

- The town of Bartın (41° 38' N., 32° 20' E.) lies about 6 miles up the river.  
20 **Lights.**—A light is exhibited, at an elevation of 230 feet (70m1), from a white concrete tower on a concrete base, 26 feet (7m9) in height, on Demirli burnu.

- A curved breakwater extends about 4 cables westward from Taşdibi burnu, the northern entrance point of Bartın limanı. A light is exhibited,  
25 at an elevation of 33 feet (10m1), from a white concrete tower on a concrete base, 23 feet (7m0) in height, on the head of the breakwater. A training wall, from which lights are exhibited, is situated on the northern side of Bartın çayı.

- Coast.**—From Demirli burnu the coast trends north-eastward for  
30 3½ miles, and thence east-north-eastward for 4½ miles to the peninsula on which stands the town of Amasra. In the latter stretch of coast there are two small inlets: Tarlaağzı limanı, the western of these, is entered eastward of Tekke burnu, 3 miles west-south-westward of Amasra, and has a small islet close off its eastern entrance point; the eastern inlet is  
35 entered westward of Kamaşlar burnu, one mile west-south-westward of Amasra. From Demirli burnu to Amasra the coast is steep-to, with no off-lying dangers, but a bank, with a depth of 10 feet (3m0) over it, extends about 3 cables from Kamaşlar burnu.

*Chart 2238.*

- 40 **Submarine Exercise area.**—Submarines exercise frequently in the area, indicated on the chart, northward of Demirli burnu. A good lookout should be kept for them when passing through this area; see page 21.

*Chart 1987, plan of Amasra.*

- AMASRA.—Lights.—Anchorages.**—The town of Amasra (41° 45' N.,  
45 32° 23' E.) is situated on a peninsula which, from a distance, appears as a group of islets. The eastern part of this peninsula is connected with the mainland by a low, sandy isthmus about three-quarters of a cable wide.

- Both parts of the town are surrounded by thick walls. About one cable northward of the eastern part of the peninsula is Ayıbalığı ada, of moderate  
50 elevation, with bold yellow sides.

Amasra light is exhibited, at an elevation of 252 feet (76m8), from a white stone tower, 17 feet (5m2) in height, situated on the north-western summit of the peninsula.

- On the western side of the isthmus which connects the peninsula with  
55 the mainland, is Küçük limanı, a small cove, the entrance to which is about

*Chart 1987, plan of Amasra.*

one cable wide but is narrowed by submerged rocks which fringe its northern and southern sides. As an anchorage, Küçük limanı is inferior to Büyük limanı, described below, and it is exposed to westerly winds. It is, however, a favourite anchorage for small craft during the summer months, since easterly winds are then frequent and the swell raised by them does not enter the cove. 5

Büyük limanı is entered between the eastern extremity of the peninsula, on which stands the town of Amasra, and Felângit burnu,  $1\frac{1}{2}$  miles east-north-eastward. 10

Amasra harbour is situated on the western side of Büyük limanı; it is protected by two breakwaters, the northern of which extends east-south-eastward for  $3\frac{1}{2}$  cables from the northern side of the peninsula, and the southern of which extends northward for about  $1\frac{1}{2}$  cables from the southern shore of the bay. 15

Lights are exhibited, each at an elevation of 33 feet (10m1) from a white metal framework tower, 20 feet (6m1) in height, on the heads of the northern and southern breakwaters.

A small jetty, from the head of which a light is exhibited, extends north-eastward from the south-western corner of the Inner harbour. 20

The best anchorage lies south-eastward of the harbour entrance in depths of from 36 to 48 feet (11m0 to 14m6), good holding ground; the eastern part of the bay is clear of dangers, with depths of from 42 to 60 feet (12m8 to 18m3), sand and mud, close inshore. There is anchorage for small vessels within the breakwaters. 25

**Regulations.**—Similar regulations to those for Karabiga, *see* page 110, are in force for Amasra.

*Chart 2278.*

**AMASRA TO INEBOLU.—Coast.—Lights.—Anchorages.**—From Felâgıt burnu ( $41^{\circ} 45' N.$ ,  $32^{\circ} 25' E.$ ) the coast trends north-eastward for  $1\frac{1}{2}$  miles to Çakraz burnu, a dark, precipitous bluff, 1,390 feet (423m7) high, which forms a useful landmark when approaching Amasra, and thence  $2\frac{1}{2}$  miles east-north-eastward to Deliklişile burnu. This stretch of coast is fringed by a narrow rocky bank, with depths of less than 18 feet (5m5), extending 2 to 3 cables offshore in places; a detached group of above-water rocks lies half a mile offshore, three-quarters of a mile north-eastward of Çakraz burnu. Deliklişile burnu may be identified by a detached, rounded summit which rises precipitously from its extremity. 30 35

Kurucaşile burnu, a narrow promontory extending half a mile from the general line of the coast, lies  $9\frac{1}{2}$  miles east-north-eastward of Deliklişile burnu, the coast between presenting no special features. 40

Kurucaşile light is exhibited, at an elevation of 135 feet (41m1), from a white concrete tower, 25 feet (7m9) in height, situated on the extremity of Kurucaşile burnu. The village of Kurucaşile lies inshore of the promontory. 45

The village of Kapisuyu, situated about 2 miles eastward of Kurucaşile burnu, stands on the western side of the mouth of a valley, which can be distinguished from a distance of about 25 miles northward. The eastern side of this valley rises to Kapı dağı (Kapu dağ), a high hill with a pointed summit which is prominent from seaward. There are a number of houses on the western side of the valley. 50

The small harbour of Gidros liman (Gideriz) ( $41^{\circ} 52' N.$ ,  $32^{\circ} 52' E.$ ) is situated about 5 miles east-north-eastward of Kapisuyu and is backed by a mountain in the form of a sugar-loaf, which assists to identify the locality. 55

*Chart 2278.*

The harbour entrance is three-quarters of a cable wide and is divided into two channels by a sunken rock about 100 feet (30m5) in extent, with a depth of 9 feet (2m7) over it and depths of 42 feet (12m8) in the fairway 5 on either side. Within the harbour the depths decrease from 35 to 18 feet (10m7 to 5m5). Small craft visit the harbour for timber during the summer months, but the entrance is difficult and requires local knowledge.

The anchorage will accommodate five or six small craft in depths of from 18 to 24 feet (5m5 to 7m3), but it is exposed to northerly winds and no 10 vessel should attempt to shelter here during a strong sea breeze except in case of necessity.

A small vessel entering should keep the eastern shore aboard to avoid the sunken rock in the entrance.

From Gidros liman the coast trends east-north-eastward for about 6½ 15 miles to Köpekkaya burnu, a point which extends a short distance north-westward from the general line of the coast and terminates in a bluff. İrmak (Koca) çay flows through a valley and enters the sea about midway along this stretch of coast, and on the eastern side of the valley is a mountain 3,210 feet (978m4) high, which helps to distinguish it. This 20 stretch of coast is at first rocky, but at some distance westward of the mouth of İrmak çay, it changes to sand. There are depths of about 12 fathoms (21m9) at about 1½ miles offshore.

The village of Cide is situated near the head of Karağaç limanı, a bight entered on the south-western side of Köpekkaya burnu. Gebeoğlu tepesi 25 rises to an elevation of 3,064 feet (934m0) about 4½ miles south-eastward of Köpekkaya burnu, *see* views [52], [53]. Anchorage, sheltered from easterly winds, can be obtained in Kaarağaç limanı, in depths of 13 fathoms (28m8), mud, or closer inshore, in depths of 18 feet (5m5), sand. The holding ground is good but the anchorage is exposed to westerly and 30 northerly winds and is only used by coasting craft.

A light is exhibited in Cide harbour at an elevation of 670 feet (204m2) from a concrete tower, 23 feet (7m0) in height, situated on Köpekkaya burnu.

From Köpekkaya burnu the coast trends east-north-eastward for 5 miles to the mouth of Aydos çayı, on the western side of which stands 35 the village of Kuşcu and on the eastern side the village of Düzköy. Thence the coast trends a further 12½ miles east-north-eastward to Kerempe burnu.

Due to lack of soundings this stretch of coast should be approached with caution.

*Charts 2237, 2238.*

40 **Kerempe burnu.** — **Navigational aids.** — Kerempe burnu ( $42^{\circ} 01' N., 33^{\circ} 20' E.$ ), is the western termination of that part of Anadolu which projects farthest northward into the Black sea, of which Sinop burnu (page 431), about 86 miles farther eastward, is the eastern extremity. Kerempe burnu is one of the highest capes on this coast; it is bordered by 45 reddish cliffs, with cultivated land within them. A saddle-shaped hill south-eastward of the cape assists in identifying it as well as the lighthouse, but in winter, when the land is covered with snow, the latter can only be distinguished from westward or eastward. *See* view [54]. This coast westward of the cape is elevated and intersected by valleys with sandy 50 beaches; it is safe to approach. *See* Appendix III.

Kerempe burnu is about 140 miles southward of the southern extremity of the Crimea, and these two promontories divide the Black sea into two parts, the western and eastern, which, owing to different winds blowing at the same time in each of them, are often very distinct. Frequently the 55 wind entirely changes direction when passing the cape and squalls are common in the vicinity.

*Charts 2237, 2238.*

A light is exhibited, at an elevation of 269 feet (82m0), from a white stone tower and dwelling situated near Kerempe burnu. The lighthouse lies 2 miles farther eastward than charted.

A fog signal is sounded from a position near the lighthouse.

*Chart 2237.*

**Kerempe burnu to İnebolu burnu.—Coast.**—From Kerempe burnu the coast trends eastward for about  $19\frac{1}{2}$  miles to İnebolu burnu. The coastal hills are cultivated to their summits and buildings may be seen in places. Off the coast between Keçin burnu and Asar burnu, about  $1\frac{1}{2}$  and  $5\frac{1}{2}$  miles, respectively eastward of Kerempe burnu, there is an open anchorage. Between the valleys of Kayran and Zarbana, about  $3\frac{1}{2}$  and 7 miles, respectively, eastward of Asar burnu, there is a prominent bare rock overhanging the sea; the latter valley, through which flows a small stream, is covered with trees, amongst which can be seen a number of buildings. This stretch of coast is covered with vegetation right down to the sea and there are no minarets in the small settlements in the valleys, whilst eastward of İnebolu burnu, the coast is bluff with bare rocks, and in the settlements there are minarets.

**Submarine Exercise area.**—Submarines exercise frequently in the area, indicated on the chart, northward of İnebolu. A good lookout should be kept for them when passing through this area: *see* page 21.

*Chart 1987, plan of İnebolu.*

**İNEBOLU.—Breakwaters.—Lights.**—İnebolu burnu ( $41^{\circ} 59' N.$ ,  $33^{\circ} 46' E.$ ) is a low bluff point, on the eastern side of which is a small harbour protected by two breakwaters. The northern breakwater extends east-north-eastward for nearly  $1\frac{1}{2}$  cables and thence one cable east-south-eastward. The southern breakwater extends  $1\frac{1}{2}$  cables north-north-eastward, its head lying  $1\frac{1}{2}$  cables southward of the head of the northern breakwater.

A light is exhibited, at an elevation of 125 feet (38m1), from a white, metal mast and dwelling, situated near the extremity of İnebolu burnu.

A light is exhibited, at an elevation of 33 feet (10m1), on the head of each breakwater.

A number of lighters are available.

The town of İnebolu, which is an open port, *see* page 10, is situated on the easternmost of the hills, 490 feet (149m4) high, within İnebolu burnu, at the mouth of a ravine spanned by a girder footbridge. The town is the port for the important town of Kastamonu, about 34 miles southward, which is the seat of local government. Fogs are frequent from March to May.

**Anchorage.**—Vessels anchor as convenient within  $2\frac{1}{2}$  cables north-eastward or eastward of the head of the northern breakwater. Loading is carried out from lighters; each lighter holds 11 tons of pyrites ore, and the loading rate is between 800 and 1200 tons per day, depending on the weather.

Vessels visiting the roadstead, especially during the winter months, are, at times, obliged to put to sea without completing work on their cargo.

**Trade.—Facilities.**—Pyrites ore is exported. Limited quantities of fresh provisions can be obtained.

**Communications.**—There is regular sea communication with İstanbul and ports in Anadolu.

**Regulations.**—Similar regulations to those for Karabiga, *see* page 110, are in force for İnebolu.



*Chart 2237.***İNEBOLU TO SINOP BURNU.—Coast.—Dangers.—Anchorages.**

- Lights.**—From İnebolu burnu the coast trends eastward for about 10½ miles to the village of Abana ( $41^{\circ} 59' N.$ ,  $34^{\circ} 01' E.$ ) off which coasters  
 5 sometimes anchor, and about 1½ miles farther eastward is Hacıveli burnu, close off which point is a detached, precipitous rock. Above-water and sunken rocks extend about half a mile north-eastward from Ginolu, about 5½ miles eastward of Hacıveli burnu. *See view [55].* The village of Türkeli lies behind Aydoğan burnu about 7½ miles eastward of Ginolu limanı.  
 10 Temporary anchorage can be obtained in depths of from 18 to 24 feet (5m5 to 7m3), mud and sand, about 5 cables east-north-eastward of Aydoğan burnu, but this anchorage is exposed to all onshore winds.

- From Aydoğan burnu the coast trends east-north-eastward for about 6½ miles to Usta burnu, which projects about one miles northward  
 15 from the general line of the coast. Anchorage, sheltered from north-westerly winds, can be obtained in depths of from 18 to 30 feet (5m5 to 9m1), sand and mud, in the bight on the south-eastern side of Usta burnu, but the anchorage is open eastward and north-eastward.

- Usta Burnu Ayancık light is exhibited at an elevation of 89 feet (27m1),  
 20 from a white metal tripod on a concrete base, 21 feet (6m4) in height, situated on Usta burnu.

- Between Usta burnu and İnce burun ( $42^{\circ} 06' N.$ ,  $34^{\circ} 57' E.$ ) about 21 miles east-north-eastward, there is a wide bight. Near the mouth of Ayancık çayı, which flows into this bight through a valley of the  
 25 same name about 5 miles east-south-eastward of Usta burnu, there is a shingle beach about 1½ miles long, within which the coastal hills rise precipitously. At the village of Ayancık, near the mouth of this river, there are two piers suitable for small craft, off which coasting craft anchor. *See views [55], [56].* A number of lighters are available.

- 30 Oluza kayaları, parts of which are above water, lies with its outer edge about one mile offshore from 4 to 6 miles eastward of the mouth of Ayancık çayı. The village of Oluza lies in a valley southward of the western extremity of this reef and there is another inhabited valley southward of the reef.

- 35 From Oluza the coast trends about 4½ miles east-north-eastward to Cebelit burnu, and thence 10½ miles to İnce burun.

- İnce burun and Sinop burnu, about 11½ miles east-south-eastward, are the north-western and north-eastern extremities, respectively, of a northerly extension of the coast which divides the western and eastern parts  
 40 of the coast of Anadolu. İnce burun is sharp, rocky and reddish in colour; Başyoz burnu, a rocky bluff about 3½ miles farther eastward, is slightly higher and also of a reddish tint.

- A light is exhibited, at an elevation of 85 feet (28m9), from a white, stone tower and dwelling, 39 feet (11m9) in height, situated on İnce burun.

- 45 Between Başyoz burnu and Ak-liman, a small cove about 2½ miles south-eastward, the coast is bold and rocky: Hamsilos (Hamsaros) burnu projects a short distance north-eastward from the coast close northward of Ak-liman, and a reef lies about half a mile offshore about 1½ miles south-eastward of Başyoz burnu. Hamsilos liman lies about 4 cables west-  
 50 ward of Hamsilos burnu, at the entrance to Deveci dere.

**Currents.**—The effects of a current setting westward have been experienced within a short distance of the coast in the vicinity of Sinop and as far westward as Kerempe burnu; farther offshore, the current sets eastward.

- 55 **Ak-liman.—Light.—Anchorage.**—The small harbour of Ak-liman lies at the north-western end of a low, sandy beach which is backed by

*Chart 2237.*

mountains and fringed by white rocks. Kara ada lies close off the northern, and Sari ada close off the southern entrance point; both these islets are rocky. Reefs extend between each of these islets and the respective entrance points and also a short distance into the harbour on either side, 5 narrowing the width of the entrance to about 2 cables.

A light is exhibited, at an elevation of 66 feet (20m1), from a white, concrete tower, 16 feet (4m9) in height, situated on Kara ada.

Anchorage, open eastward, can be obtained, in depths of from 30 to 42 feet (9m1 to 12m8), a short distance within the entrance. Vessels of 10 shallow draught can find shelter from all winds in the northern part of the harbour, where there are depths of 12 feet (3m7) about 1½ cables offshore. There is a landing jetty on the southern side of the harbour.

**SINOP AND APPROACHES.—Light.—Fog signal.**—Sinop burnu 15 (42° 02' N., 35° 12' E.) is the north-eastern extremity of Boztepe yarımadası, a peninsula which extends about 3 miles eastward from the narrow isthmus connecting it with the mainland, and rises to an elevation of 679 feet (207m0) at Hidirlek (Hidir) tepe, on which is a prominent water tower, about one mile west-south-westward of Sinop burnu. The cape can 20 easily be identified from all directions by the peculiar shape of the peninsula, the summit of which is flat and its sides, except toward the isthmus, steep. The isthmus, on which stands the town of Sinop, is scarcely visible from a distance, and the peninsula first appears as an island when approaching it from northward or southward. See views [57], [58]. 25

Gazibey (Gazilbey) Kayası, which is prominent, lies about 2 cables north-eastward of Boztepe burnu, the south-eastern extremity of the peninsula; it is steep-to.

The northern side of the peninsula is clear of dangers but its southern side should not be approached within two cables. The only landing on 30 the southern side is on a beach, at the mouth of Kalkan dere near the village of Nisiköy, about 1½ miles westward of Boztepe burnu.

Sinop light is exhibited, at an elevation of 351 feet (107m0), from a white, stone tower, 13 feet (4m0) in height, situated about halfway up the cliff at Boztepe burnu. A fog signal is sounded from the lighthouse. 35

**Local magnetic anomaly.**—A local magnetic anomaly, amounting to as much as 2½° from the normal, has been observed near Sinop.

**Anchorage.—Light.**—İç liman southward of the isthmus enjoys a good reputation even in winter, and is the safest natural anchorage on the coast between the Bosphorus and Batumi; it is exposed to winds from between 40 east and south, which are not dangerous.

Anchorage can be obtained in depths of from 30 to 60 feet (9m1 to 18m3), mud and sand, upwards of 2 cables southward of the town, with complete shelter from westerly and north-easterly gales. The coast can be 45 approached to depths of 18 feet (5m5), but in lesser depths off the town the bottom is foul with the remains of ancient jetties for a distance of about half a cable offshore. When landing, caution is necessary to avoid these remains. There is a jetty with a depth of less than 6 feet (1m8) at its head.

A pier about 590 feet (179m8) in length is situated close westward of the jetty; a red fixed light marks the head of the pier. 50

**Pipeline.—Buoys.**—A pipeline extends south-eastward from the coast nearly 1½ miles south-westward of the jetty; the pipeline is about 1½ cables in length and at its head lie three mooring buoys.

**Town.**—The town of Sinop is divided into two distinct parts; the first consists of the fortress, which is built on the isthmus with its wall rising 55 from the sea, and the second is situated on the slope of the peninsula.

*Chart 2237.*

The Governor of the district resides in the town. In 1927, the population was small, and there was then but little trade. A number of lighters are available.

- 5 **SINOP BURNU TO SAMSUN KÖRFEZİ.—Coast.—Aspect.**  
Between Boztepe burnu and Bafra burnu ( $41^{\circ} 44' N.$ ,  $35^{\circ} 58' E.$ ) about 37 miles east-south-eastward; there is a bight, the western part of which as far as the mouth of Alaçam deresi, about 18 miles west-south-westward of Bafra burnu, is backed by mountains, but the remainder of its shore is  
10 low and wooded.

Tütün tepesi 5,440 feet (1658m) high, lies about  $27\frac{1}{2}$  miles south-westward of Bafra burnu; it appears as a double cone from most directions and is a good mark.

- Kocadağ, 4,280 feet (1304m) high, lies about 22 miles southward of  
15 Bafra burnu and is a good mark for identifying that point; from northward it presents a broad summit, but from north-westward it appears as a forked cone.

- Gerze.—Light.—Anchorage.**—The town of Gerze stands on Köşk burnu, a low but prominent point at the foot of a high mountain, about  
20  $12\frac{1}{2}$  miles southward of Boztepe burnu. A reef extends about one cable eastward of the extremity of the point, and about half a cable offshore on its southern side for about  $3\frac{1}{2}$  cables from it.

Gerze light is exhibited, at an elevation of 47 feet (14m3), from a white, concrete tower, situated on the extremity of Köşk burnu.

- 25 Anchorage, reported to be safe, can be obtained in the roadstead off Gerze, southward of Köşk burnu, in depths of from 30 to 42 feet (9m1 to 12m8), mud and sand, about 4 cables offshore, with Boztepe burnu just open eastward of Köşk burnu. Small vessels can obtain anchorage sheltered from northerly winds, in a depth of 18 feet (5m5), mud and  
30 shells, about 2 cables southward of the town.

- Coast.—Anchorage.—Light.**—During winds from between east-south-east, through west, to north, anchorage can be obtained, in depths of from 48 to 54 feet (14m6 to 16m5) in a bight southward of Gürsüfet (Kurzuvet) burnu, which is situated about  $4\frac{1}{2}$  miles south-eastward of  
35 Köşk burnu.

- Kızılırmak, a river which rises in the Taurus range and is the largest river on the coast of Anadolu, enters the sea at Bafra burnu. In spite of its size, the river is only navigable by boats in its lower reaches. The town of Bafra, which is connected with the general railway system, is  
40 situated close eastward of the river about 10 miles southward of Bafra burnu.

- Bafra burnu is the northern extremity of a tree-covered plain which extends about 11 miles inland on either side of Kızılırmak, and for about 16 miles south-south-eastward as far as Kumcağız iskele, described below. The trees extend close to Bafra burnu, on either side of which point there  
45 are sandy beaches.

Bafra light is exhibited, at an elevation of 82 feet (25m0), from a white, metal, framework tower, 82 feet (25m0) in height, situated on the coast about three-quarters of a mile west-south-westward of Bafra burnu.

- Caution.**—It is probable that the delta of Kızılırmak is extending  
50 seaward; vessels should not, therefore, approach within 2 miles of Bafra lighthouse. In 1920, the sea about 6 miles eastward and north-eastward of the lighthouse was observed to be much discoloured by sand and mud.

- Bafra burnu to Kalyon burnu.—Coast.—Anchorage.—Buoy.**  
From Bafra burnu ( $41^{\circ} 44' N.$ ,  $35^{\circ} 58' E.$ ) the coast trends south-eastward  
55 for about 11 miles to İncir burnu and thence southward for about  $4\frac{1}{2}$  miles

*Chart 2237.*

to Kumcağız iskele. The whole of this stretch of coast is low and covered with trees; within it lies the large Balık gölü, which communicates with the sea near Kumcağız iskele, and several smaller lakes, which extend almost to Bafra burnu.

From Kumcağız iskele the coast trends south-eastward for about 16 miles to Kalyon burnu. The whole of this stretch of coast is reported clear of dangers, with depths of 60 feet (18m3) from  $1\frac{1}{2}$  to 3 miles offshore. There are some houses, which can be seen from the roadstead, amongst the trees on either side of the outlet from Balık gölü, and there are depths of 36 feet (11m0), mud, about 2 miles off Kumcağız iskele, but this roadstead is exposed from between north and east-south-east.

**Submarine Exercise area.**—Submarines exercise frequently in the area, indicated on the chart, north-eastward of Bafra burnu. A good lookout should be kept for them when passing through this area; see page 21).

*Charts 2237; 1986, plan of Samsun.*

**SAMSUN KÖRFEZİ.—Lights.—Aspect.—Dangers.**—Samsun körfezi is entered between Kalyon burnu and Cıva (Çaltı) burnu, situated at the mouth of Yeşilırmak (ağzı), about  $12\frac{1}{4}$  miles east-north-eastward.

The town of Samsun and the anchorage are situated in the western part of the bay, between Kalyon burnu and Çinekoğlu, about 3 miles south-eastward.

Kalyon burnu light is exhibited at an elevation of 187 feet (57m0) from a metal framework tripod, 33 feet (10m1) in height, situated about 3 cables west-north-westward of the root of the northern breakwater of Samsun harbour.

Cıva burnu light is exhibited at an elevation of 76 feet (23m2) from a white metal, framework tower, situated about one mile eastward of the mouth of Yeşilırmak.

The position of the town of Samsun may be identified by Kocadağ, described on page 432, by a dark, conical hill within Çinekoğlu, and by two hills within the town. Several tobacco plantations, which are cleared of trees, the lighthouse on Kalyon burnu, and three large white radar domes on a hill about 3 cables westward of it, also assist in identifying it.

Kalyon burnu ( $41^{\circ} 19' N.$ ,  $36^{\circ} 20' E.$ ) is low and remarkable for its brownish appearance; there is a battery on it.

In 1919, foul ground was reported to exist about  $4\frac{1}{2}$  miles north-eastward of Kalyon burnu; its charted position is approximate but it is not dangerous to surface navigation.

**Pipeline.**—A submerged pipeline extends  $3\frac{1}{2}$  cables north-eastward from the coast in a position nearly 4 miles south-eastward of Kalyon burnu.

*Chart 1986, plan of Samsun.*

**Samsun harbour.—Navigational aids.—Buoys.**—Samsun harbour is situated close south-south-eastward of Kalyon burnu and is protected by two breakwaters. The northern of these breakwaters extends in an east-south-easterly direction to a position about 8 cables from Kalyon burnu; the eastern breakwater extends in a general northerly direction for 16 cables from the western side of Makhta çay entrance, situated about  $2\frac{1}{4}$  miles south-south-eastward of Kalyon burnu. The harbour entrance between the breakwaters is about  $1\frac{1}{2}$  cables in width.

The town harbour area limits are comprised within a line drawn eastward from Kalyon burnu for about one mile: and a line drawn eastward from the eastern side of Makhta çay entrance for half a mile: and a line in a north/south direction connecting these two positions.

Within the breakwaters the harbour is quayed; except for some rocks

*Chart 1986, plan of Samsun.*

which exist off the quayage in the northern part of the harbour there was, in 1962, a dredged depth of 39 feet (11m9) in the entrance between the breakwaters, and 36 feet (11m0) southward of the entrance. The dredged  
5 areas are indicated on the chart. Southward of the inner dredged area, the depths decrease gradually to the shore.

A light is exhibited at an elevation of 49 feet (14m9) from a concrete tower, 36 feet (11m0) in height, situated on the head of the northern breakwater; a fog signal is sounded from the head of the breakwater. An-  
10 other light is exhibited on the same breakwater, at an elevation of 23 feet (7m0), from a white concrete tower situated about 2 cables westward of the breakwater head.

A light is exhibited at an elevation of 49 feet (14m9) from a concrete tower, 39 feet (11m9) in height, situated on the head of the eastern break-  
15 water.

On the western side of the harbour, about  $2\frac{1}{2}$  cables south-eastward of Kalyon burnu, a submerged pier extends south-eastward for about one cable. The seaward end is marked by a white conical buoy. Two cables south-south-westward of the root of the submerged pier, a jetty projects  
20 about  $1\frac{1}{2}$  cables south-eastward.

A light is exhibited, at an elevation of 17 feet (5m2), from a white concrete tower situated on the head of the above jetty.

Two mooring buoys are laid near the middle of this jetty.

**Pilotage.—Tugs.**—Vessels exceeding 500 tons must obtain permission  
25 from the harbour authorities to enter the harbour. Pilotage is then compulsory for such vessels entering, berthing and leaving the harbour; the pilots act in an advisory capacity only.

Vessels exceeding 2,000 tons must, in addition to the pilot, avail themselves of the services of a tug; this applies also to vessels of between 500  
30 and 2,000 tons in bad weather. Vessels of more than 4,000 tons must employ two tugs during bad weather, one ahead and one astern.

Vessels which require a pilot must sound the signals laid down for Turkish waters (*see* page 14) and, in addition, must display the signal laid down in the International Code of Signals.

35 **Regulations.**—Similar regulations to those for Karabiga, *see* page 110, are in force for Samsun ( $41^{\circ} 18' N.$ ,  $36^{\circ} 20' E.$ ).

**Prohibited anchorage.—Anchorages.**—Anchoring is prohibited within an area indicated on the chart which lies east-south-eastward of the entrance between the breakwater heads.

40 The general anchorage lies eastward and northward of the town harbour limits described above; it is exposed to winds from between north-westward and east-south-eastward and is subject to a heavy swell.

Vessels of 500 tons and less anchor in the inner harbour westward of the eastern breakwater, eastward of the mosque; larger vessels, in case of  
45 necessity, may be granted permission to anchor in this area near the breakwater. Such vessels carrying explosives or other inflammable material may anchor westward of the eastern breakwater, southward of the above anchorage.

Larger vessels carrying explosives, etc., must anchor within an area of  
50 about 3 cables radius with its centre  $19\frac{1}{2}$  cables  $145^{\circ}$  from Kalyon burnu. Other such vessels, of more than 50 tons, if instructed to anchor in the outer harbour must do so at least 6 cables eastward of the eastern breakwater.

During strong north-easterly winds vessels should be prepared for  
55 any emergency or should put to sea, and should shift berth into greater depths if close inshore.

*Chart 1986, plan of Samsun.*

**Town.—Port facilities.**—Samsun ( $41^{\circ} 18' N.$ ,  $36^{\circ} 20' E.$ ) is an open port, *see* page 10, and is one of the most important ports on the Black Sea coast of Anadolu.

The population, at the 1965 census, was 106,900. Fevers sometimes occur here. 5

The Custom House pier is about three-quarters of a mile southward of Kalyon burnu.

There are seven tugs, of which two are fitted for fire-fighting.

There were, in 1968, about 40 lighters available. 10

Fresh provisions are obtainable.

Coal and small quantities of diesel oil are available.

Drinking water is piped to the quays.

There are three hospitals.

**Trade.**—The principal exports are tobacco, cereals, flour, skins and wax, and the chief imports, cotton and woollen goods, metal and hardware. 15

**Communications.**—There is railway communication with Ankara and Terme ( $41^{\circ} 12' N.$ ,  $37^{\circ} 00' E.$ ).

There is regular communication, by sea, with İstanbul and other Black Sea ports of Anadolu. 20

There is an airfield, situated about 3 cables south-eastward of Makhta çay.

**Climatic table.**—*See* page 83.

*Chart 2237.*

**CIVA BURNU TO YASUN BURNU.—Coast.—Light.**—From Civa burnu ( $41^{\circ} 22' N.$ ,  $36^{\circ} 39' E.$ ) (page 433), the coast trends east-south-eastward for about 20 miles to Çaltı burnu and thence turns southward and eastward forming a wide bight as far as Fashane burnu, about 14 miles farther east-south-eastward. The whole of this stretch of coast is low and wooded. Foul ground extends about  $1\frac{1}{2}$  cables offshore in places between Civa burnu and Çaltı burnu, and the depths for about one mile offshore on this part of the coast, are variable, being, in places, not more than from 18 to 24 feet ( $5m_5$  to  $7m_3$ ). 30

A light is exhibited at an elevation of 39 feet ( $11m_9$ ) from a metal framework tower, with dwelling, 33 feet ( $10m_1$ ) in height, situated on Çaltı burnu. 35

During north-westerly winds, good anchorage can be obtained, in depths of from 24 to 30 feet ( $7m_3$  to  $9m_1$ ), mud, off the mouth of Terme çayı, which flows into the western side of the bight, about  $2\frac{1}{4}$  miles southward of Çaltı burnu ( $41^{\circ} 15' N.$ ,  $37^{\circ} 02' E.$ ). 40

**Ünye körfezi. — Aspect. — Light. — Anchorage.** — Ünye körfezi is entered south-eastward of Fashane burnu ( $41^{\circ} 09' N.$ ,  $37^{\circ} 18' E.$ ), which point affords shelter from winds westward of north-west to vessels anchored close inshore, but the bay is exposed to northerly and easterly winds. Fashane burnu is fringed by a reef which extends about one cable offshore, and depths of 30 feet ( $9m_1$ ) and less extend about a quarter of a mile off this point. An islet, on which is a chapel, lies close inshore about half a mile westward of the point. 45

Mozen dağ, 2,330 feet ( $710m_2$ ) high, lies about 4 miles within the coast between Fashane burnu and the mouth of Terme çayı; from north-westward it is easily identified by its sharply-pointed summit, westward of which there are three hillocks, and eastward one hillock, all about the same elevation; from eastward it appears as a four-toothed saw. 50

The town of Ünye, with a population, in 1942, of about 2,000, is built on the slopes of the hill within Fashane burnu, and is backed by wooded 55

**Chart 2237.**

mountains. It has some white, two-storeyed buildings and a large mosque. See view [59].

- 5 Ünye light is exhibited at an elevation of 62 feet (18m9), from a metal framework tower, 13 feet (4m0) in height, situated on Fashane burnu.

Anchorage may be obtained in depths of about 24 feet (7m3), mud and sand, about 5 cables offshore, eastward of the town. Within this distance the depths decrease gradually towards the town, the bottom being sand. Vessels should moor with open hawse north-eastward, as winds from that quarter are dangerous.

A wharf about three-quarters of a cable in length projects eastward from the shore about 5½ cables south-south-westward of the light-structure. There is also a small pier near the Custom house.

- 15 **Fatsa körfezi.—Dangers.—Light.**—Fatsa körfezi is entered between Metrepol burnu, a point at the mouth of Çeş deresi, about 5 miles east-south-eastward of Fashane burnu, and Yasun burnu, about 13½ miles eastward. The coast of this bay is steep-to, there being depths of 13 fathoms (28m8) close inshore. It is open northward, affords but indifferent anchorage, and is frequented by few vessels.

- 20 Fatsa bankı, a reef, parts of which dry, lies about one mile eastward of Kireççi burnu, which is situated about 4½ miles south-eastward of Metrepol burnu. In 1894, a submerged rock, being the remains of an old breakwater, was reported about midway between Fatsa bankı and the coast westward; mariners are cautioned, therefore, not to use the channel westward of the reef.

Fatsa light (41° 03' N., 37° 31' E.) is exhibited, at an elevation of 20 feet (6m1), from a white metal framework tower on a concrete base, situated on the southern extremity of the drying part of Fatsa bankı.

- 30 Yasun burnu is low and has an old monastery on it; from an offing of about 30 miles north-eastward it appears as several hillocks. Kharman Kaliya, a shoal with a depth of 12 feet (3m7) over it lies within three-quarters of a mile northward of the old monastery, and an unexamined shoal with a depth of 16 feet (4m9) on it, lies about 1½ miles farther north-north-eastward. See views [60], [61].

- 35 Yasun burnu light is exhibited, at an elevation of 36 feet (11m0), from a white metal framework tripod on a concrete base, 23 feet (7m0) in height, situated close northward of the monastery.

- The town of Fatsa is situated on the eastern side of the mouth of Kes (Fatsa) deresi, in the south-western corner of the bay, about 1½ miles south-south-eastward of Kireççi burnu. In the centre of the town there is a mosque which is prominent from seaward. There are two jetties but landing is generally effected on the open sandy beach. See view [62]. In 1962, a jetty, 197 feet (60m0) long, was under construction.

- 45 **Directions.—Anchorage.**—The following directions were reported in 1962. A vessel should approach Fatsa körfezi on a course of 180°, passing about 5 cables eastward of Fatsa bankı, when course should be altered south-westward for the anchorage. After crossing the 66-foot (20m1) line, vessels may anchor about 3 to 3½ cables offshore. The water in the anchorage is very discoloured due to the discharge of silt from Kes deresi.

50 **Chart 2236.**

**YASUN BURNU TO IŞIKLI BURNU.—Aspect.**—Westward of Işikli burnu, which is situated about 78 miles eastward of Yasun burnu, the coastal hills are lower than those eastward; the mountains recede farther inland and there is no continuous snow-capped range.

- 55 Çal dağ, 6,627 feet (2019m9) high, situated about 10½ miles inland

*Chart 2236.*

and about 39 miles south-eastward of Yasun burnu, and Sis dağı, 7,090 feet (2161m0) high, situated about 19 miles south-westward of Fener burnu, are especially prominent. The former mountain is conical but the appearance of the latter varies from different directions. *See views [63], [64].* 5

*Charts 2237, 2236.*

**YASUN BURNU TO GİRESUN.—Coast.—Light.**—Between Yasun burnu and Çam burnu ( $41^{\circ} 07' N.$ ,  $37^{\circ} 47' E.$ ) about  $5\frac{1}{2}$  miles eastward, the coast forms a bight which affords anchorage sheltered from east, through south, to west. Hoynat kalesi, an islet on which there is a tower, lies close offshore about midway between these two points. *See view [61].* 10

A light is exhibited, at an elevation of 127 feet (38m7), from a white, metal column, 20 feet (6m1) in height, situated on Çam burnu.

**Perşembe limanı. — Pipeline. — Buoyage. — Anchorages.** — Perşembe limanı is entered between Çam burnu and Bozuk kale, a steep, rocky promontory about 7 miles south-south-eastward. Perşembe koyu, a small bight in the southern part of the bay, is entered south-eastward of Hanit burnu, a rocky point situated about 5 miles southward of Çam burnu. A reef extends a short distance off Bozuk kale. 15

A pipeline, marked at each end by a can buoy, is situated about a quarter of a mile seaward of Perşembe,  $2\frac{1}{4}$  miles southward of Çam burnu. 20

Perşembe limanı affords the best anchorage on this part of the coast on a bottom of sand and good holding ground; though exposed to winds from between north and east-south-east, it is reported that such winds rarely blow home. Violent squalls, however, may be experienced during offshore winds, and these should be guarded against. Numerous sailing craft which cannot be hauled up on the various beaches winter in Perşembe limanı. 25

Anchorage can be obtained off Çeşmeönü, Kışla and Perşembe, about  $1\frac{1}{2}$ , 2 and  $3\frac{1}{2}$  miles, respectively, south-south-westward of Çam burnu. The anchorage off Çeşmeönü is considered the best, there being depths of 60 feet (18m3), sand and mud, with good holding ground, about a quarter of a mile offshore. 30

*Chart 2237.*

Anchorage can also be obtained in Perşembe koyu but the anchorages in the northern part of Perşembe limanı are much to be preferred. Perşembe koyu is rendered distinctive by an extensive beach fringing its shore. There are depths of 30 feet (9m1), sand and shells, about 3 cables offshore, increasing to 20 fathoms (36m6), sand and mud, about 8 cables offshore. 40

*Chart 2236.*

**Bozuk kale to Giresun.—Coast.—Anchorage.—Danger.**—Bozuk kale ( $41^{\circ} 01' N.$ ,  $37^{\circ} 52' E.$ ) is the north-eastern termination of a steep promontory which rises to an elevation of 1,837 feet (559m9) at Boztopeköy, about  $1\frac{1}{2}$  miles within it; it extends north-eastward between the beaches of Perşembe koyu and Meletağzı, the mouth of Melet ırmağı, about  $3\frac{1}{2}$  miles south-eastward of the point. 45

The town of Ordu in which there is a prominent white minaret, is situated on the eastern slope of the promontory, about one mile eastward of Boztopeköy. A jetty, equipped with an 8-cwt. crane, and with a depth of 16 feet (4m9) at its head, projects from a sandy, shelving beach abreast the north-eastern end of the town. A number of lighters are available. In 1942, the population of Ordu was about 10,000. 50

The roadstead off the town is sheltered from westerly winds but is exposed to those from between north and east. Good anchorage can be obtained, in depths of from 36 to 54 feet (11m0 to 16m5), mud and sand,



*Chart 2236.*

with a small point, situated about midway between the town and Bozuk kale, bearing between  $326^{\circ}$  and  $338^{\circ}$ . There are depths of 24 feet (7m3) with Çam burnu just open north-eastward of Bozuk kale. The southern  
 5 part of the roadstead is shallow. With northerly winds, vessels should shift berth to Perşembe limanı.

Between Ordu and the mouth of Turnasuyu, about  $5\frac{1}{2}$  miles eastward, the coast is low; thence to the mouth of Bozarsuyu, about 9 miles farther eastward, it is hilly and wooded.

10 Ayvasil burnu ( $40^{\circ} 57' N.$ ,  $38^{\circ} 19' E.$ ), about 5 miles eastward of the mouth of Bozarsuyu, rises to Dikmen tepesi, 1,703 feet (519m1) high, about  $1\frac{1}{2}$  miles south-south-westward of the point; owing to its dark colour this mountain is a good mark from all directions seaward and, when seen from north-eastward, appears conical. There are some large houses on Burun-  
 15 ucu, a small point about half a mile eastward of Ayvasil burnu. Westward of Dikmen tepesi there is a populated valley about 3 miles wide through which flows Bozarsuyu and Bulancık deresi. The large village of Bulancık, at which there is a jetty, is situated close westward of the mouth of Bulancık deresi.

20 A bank, with depths of less than 13 feet (4m0) over it, extends over one mile in places from the coast westward of Ayvasil burnu ( $40^{\circ} 57' N.$ ,  $38^{\circ} 19' E.$ ).

*Chart 1987, plan of Giresun.*

**GİRESUN.—Dangers.—Light.**—From Ayvasil burnu the coast  
 25 trends east-south-eastward for about 5 miles to the root of a promontory, 425 feet (129m5) high, which projects about three-quarters of a mile northward from the general line of the coast at the foot of the mountains. The town of Giresun which is an open port, *see* page 10, is situated on both sides of this promontory, and on its summit are several towers from  
 30 which the walls of the old fortress extend down the slopes; a prison stands on the north-western extremity of the promontory. There are many churches and gardens in the residential part of the town, and there is a hospital.

Çal dağ, described on page 436, rises about 11 miles southward of  
 35 Giresun and is a good mark when approaching the port in clear weather. *See* views [63], [64].

Giresun light is exhibited, at an elevation of 334 feet (101m8), from a white round tower and a dwelling, situated about one cable south-south-eastward of the northern extremity of the promontory.

40 Palamut Kayası situated about 4 cables north-eastward of the northern extremity of the promontory is 3 feet (0m9) high; and it should be given a berth of at least one cable.

Körtas bankı, with a least depth of 3 feet (0m9) over it, lies  $1\frac{1}{2}$  cables southward of Palamut Kayası.

45 Batlama deresi enters the sea about  $1\frac{1}{2}$  miles south-westward of the northern extremity of the promontory.

**Giresun Inner harbour.—Lights.—Danger.**—Giresun harbour ( $40^{\circ} 55' N.$ ,  $38^{\circ} 23' E.$ ) lies on the western side of the above promontory and is protected by two breakwaters; the eastern side of the harbour is  
 50 quayed and lighters are available.

The northern breakwater extends westward and south-westward from the north-western end of the promontory for about  $4\frac{1}{2}$  cables. Its head is marked by a concrete tower, 18 feet (5m5) in height, from which a light is exhibited at an elevation of 29 feet (8m8).

55 The southern breakwater extends 2 cables north-north-westward from a

*Chart 1987, plan of Giresun.*

position of the coast about half a mile south-westward of the root of the northern breakwater; its head is marked by a light-tower similar to that of the northern breakwater.

Within the harbour there are general depths of from 30 to 42 feet (9m1 to 12m8) in its northern part; there are depths of from 15 to 30 feet (4m6 to 9m1) in the south-eastern part of the harbour. 5

The deep-water quay is situated on the eastern side of the northern part of the harbour; the depth alongside is not known but there are depths of 39 to 42 feet (11m9 to 12m8) in the vicinity. 10

There is a wharf available for small craft, equipped with a 5-ton crane, situated about 2½ cables north-eastward of the root of the southern breakwater; the Customs house stands in this vicinity.

**Harbour Limits.**—The outer harbour is contained between a line drawn 270° from Giresun Main light, and a line drawn in a 000° direction 15 from the entrance to Batlama deresi, and a line drawn between the heads of the two breakwaters.

**Pilots.—Tugs.**—Similar regulations for pilots and tugs to those for Samsun, *see* page 434, are in force for Giresun.

**Regulations.**—Similar regulations to those for Karabiga, *see* page 110, 20 are in force for Giresun.

**Prohibited anchorages.—Anchorages.**—Anchorage is prohibited in the approach to the inner harbour within 2 cables of the heads of the breakwaters, inside an area contained by lines drawn in a 270° direction 25 from the light-structures.

The anchorage for vessels carrying explosives and other inflammable materials is situated north-north-eastward of the northern breakwater, within a circular area of 2½ cables radius with its centre about 4 cables 322° from Giresun light-structure.

The anchorage for vessels exceeding 500 tons lies southward of a line 30 drawn in a 270° direction from the head of the southern breakwater.

Vessels sometimes anchor in the roadstead off the mouth of Batlama deresi, in depths of about 20 fathoms (36m6).

Coasting vessels anchor in Demir-kapi liman, in depths of from 12 to 13 fathoms (21m9 to 23m8), a short distance eastward of the promontory. 35 This anchorage is sheltered from west to north-west, but is exposed to northerly winds, which raise a heavy surf. There is better anchorage farther offshore in a depth of 16 fathoms (29m3).

*Chart 2236.*

**GİRESUN TO TİREBOLU.—Coast.—Anchorages.—Danger.** 40 About 1½ miles eastward of the promontory on which the town of Giresun is situated there is a point, close off which are a number of above-water and sunken rocks. Giresun adası (40° 56' N., 38° 28' E.), on which there are the ruins of an old fort, lies about one mile north-eastward of this point and affords some shelter to the bight eastward of it. Small craft with 45 local knowledge may obtain anchorage, in depths of from 60 feet to 12 fathoms (18m3 to 21m9) in this bight, with shelter from westerly and north-westerly winds.

Near the village of Keşap, which is situated about 3 miles eastward of Giresun adası and close to the mouth of a small stream (River Kessab), 50 there is a large, white building. From Keşap the coast trends east-north-eastward for about 6½ miles to Çam burnu (40° 59' N., 38° 39' E.) a high point which forms the north-eastern extremity of a broad headland rising to an elevation of 1,791 feet (545m9), about 1½ miles southward of this point.

*Chart 2236.*

Within this stretch of coast the hills are rugged in appearance, but westward of Keşap there is a low beach.

A light is exhibited, at an elevation of 54 feet (16m5), from a metal framework tower, 21 feet (6m4) in height, on Çam burnu.

Esbiye koyu is entered between Çam burnu and Kilise burnu, about 7 miles east-north-eastward. About 3 cables north-north-westward of Kilise burnu there is a group of islets, named Firin adalari; in 1880, a shoal, with a depth of 5 feet (1m5) over it, was reported to lie about one cable northward of the western rocky islet.

The western side of Esbiye koyu is steep and rocky, with greyish coloured cliffs and, near Çam burnu, is fringed by a rocky ledge on which the sea generally breaks. The southern and eastern shores of the bay are sandy and the village of Esbiye stands at its head, close westward of the mouth of Gelevar deresi.

Small craft anchor, in depths of from 30 to 60 feet (9m1 to 18m3), sand and mud, about half a cable off the western shore of Esbiye koyu. This anchorage is sheltered from east-north-east, through south, to north-west.

**TIREBOLU.—Light.—Anchorage.**—Kilise burnu is the western-most of three small points which project a short distance northward from the general line of the coast, enclosing two small coves between them; the town of Tirebolu stands on and at the roots of these points.

Tirebolu light is exhibited, at an elevation of 88 feet (26m8), from a white, framework structure, situated on Kale burnu, the easternmost of the three points, about 1½ miles eastward of Kilise burnu.

In fine weather, the locality may be readily identified by Sis dağı, described on page 437, and when this mountain is obscured by fog or haze, Tirebolu light-structure should be a good mark. The buildings of the town, which include several minarets, are prominent from an offing. In 1942, the population of Tirebolu was about 8,000.

Harşit deresi flows down a ravine and enters the sea about half a mile eastward of Tirebolu light-structure; there is a group of houses close eastward of its mouth, and farther eastward there is a sandy beach.

The western of the two coves at Tirebolu is encumbered with rocks, and a rocky reef extends about 6 cables northward from Kilise burnu; the eastern cove has depths of 18 feet (5m5), and can accommodate a number of small craft with warps to the western side, but it is exposed to northerly winds. A small number of lighters are available.

The best anchorage is in the roadstead north-eastward of the town, in depths of from 36 to 48 feet (11m0 to 14m6), hard sand, off the sandy beach near the mouth of Harşit deresi.

**TIREBOLU TO TRABZON.—Coast.—Anchorages.—Light.**—From Kale burnu the coast trends east-north-eastward for about 6 miles to Kara burnu (41° 03' N., 38° 56' E.), a low point which rises to a dark, conical hill within it; the coastal hills within this stretch of coast are lower than those farther eastward.

From Kara burnu the coast trends eastward for about 10 miles to Kale burnu, the north-western extremity of a low, wide projection, of which Zeytin (Zeytün) burnu, about one mile farther eastward, is the north-eastern extremity; some mines and a ruined castle stand on Kale burnu. Görele deresi, Çavuşlu deresi, and Eynesil deresi flow into this stretch of coast about 3, 6 and 9 miles, respectively, eastward of Kara burnu.

There is a small jetty which is available for small craft at the town of Görele, which stands on the eastern side of the mouth of Görele deresi.

**Chart 2236.**

Hills rise steeply within the town and the coast in the vicinity is fringed by a shelving shingle beach. There is sea communication between Görele and other Turkish ports. Lighters are available.

Büyük liman is entered between Bostan burnu, a wooded point near which are some buildings, about three-quarters of a mile south-eastward of Zeytin burnu, and Işikli burnu, about  $11\frac{1}{2}$  miles east-north-eastward. There is good anchorage, sheltered from east, through south, to west, off the mouth of Camlık deresi, about three-quarters of a mile south-eastward of Bostan burnu.

There is a jetty abreast the village of Vakfikebir which is situated on the western side of the mouth of Fol deresi, about 5 miles east-south-eastward of Bostan burnu. Abreast Vakfikebir, there is a sandy beach within which rise wooded hills. There is regular sea communication with other Turkish ports. Lighters are available.

Işikli burnu ( $41^{\circ} 07' N.$ ,  $39^{\circ} 26' E.$ ) projects northward from the general line of the coast and has several white patches in its vicinity; it is high and is visible in clear weather from a distance of 60 miles. Işikli burnu is reddish in colour and rises to a cultivated, conical hill. *See* views [65], [66].

A light is exhibited, at an elevation of 82 feet (25m0), from a stone tower and dwelling situated on Işikli burnu.

**Submarine Exercise area.**—Submarines exercise frequently in the area, indicated on the chart, northward of Işikli burnu. A good lookout should be kept for them when passing through this area; *see* page 21.

**Işikli burnu to Akçaabat.**—**Coast.**—From Işikli burnu the coast trends east-south-eastward for about  $3\frac{1}{2}$  miles to Akçakale, and then south-eastward for about 4 miles to Zangana burnu. Small craft with local knowledge can obtain shelter from north-westerly winds close inshore in İncir limanı, a small bight on the eastern side of Işikli burnu.

*Chart 2236, plan of Polathane.*

**Akçaabat.**—**Anchorage.**—Zangana burnu is fringed by sunken rocks which extend about one cable offshore. The town of Akçaabat (Polathane) is situated on the slope of a hill about three-quarters of a mile south-south-eastward of Zangana burnu. The town is fronted by a beach of loose sand about half a mile long, and Kireçhane deresi and Kalenima deresi enter the sea close southward, and about one mile east-south-eastward, respectively, of Akçaabat. There is a minaret in the town,  $1\frac{1}{2}$  miles south-south-eastward of Zangana burnu.

The roadstead off Akçaabat affords good anchorage and is considered to be a better anchorage than the roadstead off Trabzon, *see* page 443, it being sometimes possible for vessels to land passengers and discharge cargo here when it is impossible to do so at Trabzon. Although this roadstead is exposed from north-north-west to east, it provides good anchorage in winter.

Anchorage can be obtained, in depths of from 60 feet to 15 fathoms (18m3 to 27m4), about half a mile north-eastward of the minaret in the town. Vessels should moor with open hawse towards the shore as winds off the land are violent.

**Chart 1987, plan of Trabzon.**

**TRABZON.**—**Aspect.**—**Light.**—The town of Trabzon lies spread over three hills within Güzelhisar burnu ( $41^{\circ} 01' N.$ ,  $39^{\circ} 44' E.$ ) about 9 miles east-south-eastward of Zangana burnu. Parts of the town date back to 700 B.C., but it is now an important and modern port. The small artificial harbour is situated in a bight on the eastern side of the town. The hills on which the town stands are divided by ravines, over which

*Chart 1987, plan of Trabzon.*

there are a number of bridges. The greater part of the town is visible from seaward, the old monastery of St. Sophia, about  $1\frac{1}{2}$  miles westward of Güzelhisar burnu, being very prominent. A citadel on Güzelhisar burnu  
 5 overlooks the town and harbour. The suburbs of Trabzon extend eastward to Degirmen dere, which enters the sea about one mile east-south-eastward of Güzelhisar burnu; the mouth of this river is fronted by a beach, and a short distance upstream the river is spanned by a stone bridge with several arches. There are several minarets in the town and a  
 10 number of mills on the western bank of Degirmen dere.

From an offing the locality may be identified by Boz tepe, a hill about 800 feet (243m8) high, about three-quarters of a mile southward of Güzelhisar burnu. On the slope of this hill is a mosque, a large building surrounded by walls. See Appendix III.

15 Trabzon light is exhibited, at an elevation of 102 feet (31m1), from a white, metal column 20 feet (6m1) in height, situated at the edge of the cliff at Güzelhisar burnu.

Sunken rocks extend about half a cable northward of Güzelhisar burnu, and, close off the base of the cliff under the light-structure, there is a rock,  
 20 20 feet (6m1) high. The remains of an ancient port, now almost wholly submerged, extend  $1\frac{1}{2}$  cables seaward off Belediye İskelesi, at the foot of the old walled town, three-quarters of a mile westward of Güzelhisar burnu.

**Harbour.—Breakwaters.—Depths.—Light.**—The harbour is protected from northward by a breakwater which extends in an east-south-  
 25 easterly direction for 2,400 feet (731m5) from a position about  $1\frac{1}{2}$  cables eastward of Güzelhisar Burnu light-structure; it is fitted with bollards at intervals of 100 yards (91m4), for vessels to berth stern-to. A second breakwater extends in a north-north-westerly direction for 900 feet (274m3) towards the head of the northern breakwater, from a position  
 30 on the coast about three-quarters of a mile south-eastward of Güzelhisar burnu, forming a basin known as Büyük liman or Inner harbour, with an entrance about 2 cables wide between the breakwater heads.

From Eleusa burnu, situated about 3 cables westward of the root of the southern breakwater ( $41^{\circ} 00' N.$ ,  $39^{\circ} 45' E.$ ), Eleusa Burnu breakwater  
 35 extends north-north-eastward for about 450 feet (137m2), and thence east-north-eastward towards the southern breakwater for about 850 feet (259m1), forming Küçük liman, at the south-eastern corner of Büyük liman.

There are depths of 26 to 31 feet (7m9 to 9m4) in the northern part of Büyük liman, but the southern part of the basin is shallow, with depths of  
 40 from 7 to 18 feet (2m1 to 5m5). In Küçük liman there are depths of from 7 to 14 feet (2m1 to 4m3).

A light is exhibited, at an elevation of 33 feet (10m1), from a white concrete tower situated on the head of the northern breakwater of Büyük liman.

45 A light is exhibited, at an elevation of 19 feet (5m8), from a metal framework tower, 13 feet (4m0) in height, situated on the head of Eleusa Burnu breakwater.

A metal framework beacon stands on the head of the eastern breakwater.

**Quays.—Jetties.**—Main quay, which occupies the western side of  
 50 Büyük liman extends 1,312 feet (399m9) south-south-westward from close southward of the root of the northern breakwater; it has berths for two vessels, not exceeding 600 feet (182m9) in length, and has a depth of about 30 feet (9m1) alongside. The Customs quay, which is the landing place for passengers and boats, is situated at the northern end of Main quay.

55 A jetty extends north-eastward for half a cable, from a position about  $4\frac{1}{2}$  cables westward of the light on the head of Eleusa Burnu breakwater.

*Chart 1987, plan of Trabzon.*

Eleusa Burnu Breakwater quay, situated in Küçük liman on the southern side of the arm of that breakwater, is 492 feet (150m) long; it has a depth of only 3 feet (0m9) alongside.

Two small jetties, suitable only for small craft, extend from the southern side of Küçük liman. 5

Strong northerly winds raise a heavy sea, capable of parting the hawsers of vessels berthed in either Büyük or Küçük liman. It is reported that mariners prefer to put to sea during gales from this quarter rather than ride them out in harbour. It is also reported that, in these conditions, entry to the harbour is dangerous, owing to the risk of vessels being blown down on to the breakwater of Küçük liman, due to the unavoidably slow speed imposed by the limited manoeuvring space. 10

**Pilotage.—Tugs.**—Similar regulations for pilots and tugs to those for Samsun, *see* page 434, are in force for Trabzon. 15

**Regulations.**—Similar regulations to those for Karabiga, *see* page 110, are in force for Trabzon.

**Prohibited anchorage.—Anchorages.**—Anchorage is prohibited in an area contained within a line drawn in an 003° direction for 4½ cables from the northern breakwater light-structure, and a line in an 018° direction for 6½ cables from the head of the southern breakwater. 20

Anchorage for vessels of less than 300 tons is obtainable within Büyük liman.

Vessels carrying explosives or other inflammable material must anchor within a circular area of 2½ cables radius with its centre about 6 cables north-eastward of the head of the northern breakwater; two such vessels, if of suitable draught, may berth within Küçük liman. 25

In fine weather, general anchorage can be obtained in depths of from 12 to 16 fathoms (21m9 to 29m3), about half a mile offshore, either about one mile westward, or 1½ miles eastward of Güzelhisar burnu (41° 01' N., 39° 44' E.). The roadstead is exposed to winds from west-south-west, through north, to east-south-east, and owing to the rapid decrease in depths inside the 60-foot (18m3) line, breakers are reported to extend some distance offshore in heavy weather. In these circumstances, vessels should either put to sea or should seek shelter off Akçaabat (page 441) or Araklı (page 444). The appearance of Işıklı burnu gives a good indication of the probable weather. If this cape is free from clouds and clearly visible fine weather may be expected, but if it is covered with clouds, the weather will probably become bad. 30

**Town.—Port facilities.**—Trabzon is an open port, *see* page 10, and is the principal town in the province of the same name. The climate is, in general, good, and epidemic diseases are rare. Malarial fevers occur, mainly in summer and chiefly in the lower parts of the town. At the 1965 census, the population was 65,600. 40

Very small stocks of coal are maintained. 45

Small supplies of Diesel oil and petrol are available for small craft. Fresh provisions are plentiful. Fresh water is available.

There are two small harbour tugs and a number of lighters in the port.

There are several cranes on Main quay, the largest being 25 tons capacity. There is a 15-ton crane on Eleusa Burnu Breakwater quay. 50

**Trade.**—The chief exports are hazel nuts, tobacco, beans, cattle, cereals, wool, eggs and skins; imports are cotton and woollen goods, leather, hardware and metals.

**Communications.**—There is communication, by sea, with other ports in the Black Sea. *See* page 3. 55

There is a civil airport.

*Chart 2236.*

**TRABZON TO RIZE. —Coast. — Dangers. — Anchorages. — Light.**—From the mouth of Değirmen dere (page 442), the coast trends eastward for about three-quarters of a mile to Hupsi burnu, and thence east-south-eastward for about 3 miles to Kovata burnu ( $40^{\circ} 59' N.$ ,  $39^{\circ} 50' E.$ ) a rocky point with some gardens and small houses on its slopes. A reef, with depths of less than 30 feet (9m1) over it, the outer edge of which is steep-to, extends about half a mile off Kovata burnu.

Between Kovata burnu and Yanbolu (Falkoz) burnu, about 8 miles east-south-eastward, the coast forms a slight bight, the western part of which is Kovata limanı. Kovata limanı affords anchorage, sheltered from westerly winds, off the village of Yomra, which is situated about 3 miles south-eastward of Kovata burnu and close westward of the mouth of Kalafa deresi. There is a sandy beach near the mouth of Kalafa deresi which affords landing in fine weather. A rock, with depths of less than 6 feet (1m8) over it, is charted about half a mile offshore, about midway between Kovata burnu and the mouth of Kalafa deresi. A rocky bank fringes the coast between Yomra and Yanbolu burnu.

From Yanbolu burnu the coast trends eastward for about 3 miles to Araklı burnu; during offshore winds there is sheltered landing on a beach about half a mile long near the mouth of Yanbulu deresi, about midway along this stretch of coast.

**Sürmene koyu. —Light. —Anchorage.**—Sürmene koyu is entered between Araklı burnu and the large village of Of, which stands at the mouth of İstala deresi, about 10 miles eastward. Araklı burnu is a rocky headland on which there is a ruin and a flagstaff; this headland should be given a berth of 4 cables. There is a small jetty at the head of Araklı limanı, a small bight about one mile south-eastward of Araklı burnu. The town of Sürmene (Hamargân) is situated at the head of Sürmene koyu, about 4 miles south-eastward of Araklı burnu; in 1942, its population was about 3,000. A small number of lighters are available here.

Sürmene light is exhibited, at an elevation of 90 feet (27m4), from a white, concrete tower, situated on the coast close north-westward of the town of Sürmene.

Temporary anchorage, in a depth of 20 fathoms (36m6), may be obtained in the western part of Sürmene koyu, and landing may be effected on a beach more than one mile long, but this beach is exposed to northerly winds. The locality is subject to malaria and should be avoided during the summer months.

From the village of Of the coast tends east-north-eastward for about 13 miles to Priyos (Piriyos) burnu.

*Chart 2236, with plan of Rize.*

**RIZE. —Aspect. —Danger. —Light.**—The town of Rize stands on rising ground on the south-western shore of a bay which is entered between Priyos burnu and the mouth of Taşlı deresi, about 3 miles eastward. In contrast to other places on this coast, this town is said to be very healthy; the vegetation is luxuriant and the coastal slopes are covered with orange and lemon groves. In 1935, the population was about 17,000. There is a hospital in the town.

The best landmarks for identifying Rize are Mount İohannis and Ayana tepesi (Kalon Oros), about 1,600 and 2,890 feet (487m7 and 880m9) high, respectively, situated about 4 and  $5\frac{1}{2}$  miles southward of Priyos burnu. The summits of these mountains in line lead to a position off the mouth of Taşlı deresi. See view [67].

Priyos burnu is fringed by foul ground which extends as much as a

*Chart 2236, with plan of Rize.*

quarter of a mile offshore; a rock, awash, lies about  $3\frac{1}{2}$  cables west-north-westward of the point, and about  $1\frac{1}{2}$  cables offshore. The foul ground continues off the coast between Priyos burnu and Tower point, about 6 cables south-eastward.

Rize light is exhibited, at an elevation of 51 feet (15m5), from a metal framework structure on a white hut, situated on Priyos burnu.

**Anchorage.**—Anchorage in the roadstead off the town is exposed to winds northward of north-west, which may raise a heavy sea and prevent communication with the shore. Gales are prevalent from December to February during which period vessels either put to sea in bad weather, or anchor in the eastern part of the bay where anchorage is considered safe, and in which sailing craft lie up for the winter. In 1953, it was reported that the depths charted in the bay were unreliable.

**Facilities.**—There is a small landing pier for passengers, with depths of over 6 feet (1m8) at its head; part of the pier was damaged in 1948 and an obstruction, the charted position of which is approximate, lies close eastward of it.

Fresh provisions can be obtained.

A small number of lighters are available.

**Communications.**—There is regular sea communication with İstanbul and ports in Anadolu.

**Current.**—The current from Taşlı deresi, sets in a westerly direction and attains a rate of about half a knot in summer. In winter, this current is sufficiently strong to keep vessels anchored in the eastern part of the bay from tautening their cables.

*Chart 2236.*

**Local Magnetic anomaly.**—A Local Magnetic anomaly has been reported on this part of the coast, northward of Rize.

**RIZE TO TURKISH/U.S.S.R. FRONTIER. — Coast. — Light.**— Between the mouth of Taşlı deresi and Kemer burnu ( $41^{\circ} 07' N.$ ,  $40^{\circ} 45' E.$ ), about 9 miles east-north-eastward, the coast forms a slight bight which is backed by high mountains. From Kemer burnu the coast continues east-north-eastward for about  $7\frac{1}{2}$  miles to the town of Pazar, which is situated in a gap in the coastal hills. Kiz kalesi, a bold rock close inshore about 2 miles westward of Pazar, can readily be identified by the ruins of a fort on it. There is a derelict jetty and a small number of lighters at Pazar. In 1940, the population of Pazar was about 3,000.

A light is exhibited at an elevation of 49 feet (14m9) from a metal framework pylon, 10 feet (3m0) in height, situated on the fort on Kiz kalesi.

Two mooring buoys lie one cable offshore of Lanus burnu (Kalecik point), situated 2 miles west-south-westward of Kiz kalesi.

The roadstead off Sapo, a village at the head of a small bight about  $1\frac{1}{2}$  miles eastward of Pazar, is much used by coasting vessels.

The stretch of coast between Rize and Pazar is fringed by a shelving, shingle beach, with rocky cliffs in places, within which wooded hills rise steeply.

Büyük (Furtuna) deresi flows over a rocky bed and enters the sea about 4 miles east-north-eastward of Pazar; the winding valley through which the river flows can be seen from an offing. On the western side of the mouth of this river there is a tree-covered hill with three perpendicular sides which is locally known as Eskitrabzon and appears as a tableland; on its eastern side there is a minaret.

**Ardeşen. — Anchorage.**—The town of Ardeşen is situated on the coast



*Chart 2236.*

about 3 miles east-north-eastward of the mouth of Büyük deresi, but few of its houses are visible from seaward. Manganese ore is exported, and it is reported that, in fine weather, anchorage, in depths of about 33 feet (10m), good holding ground, can be obtained about  $3\frac{1}{2}$  cables offshore abreast the town, but this anchorage is exposed to all winds from west, through north, to east. There are two loading piers and a few lighters are available. Fresh provisions may be obtained.

**Coast.**—From the mouth of Büyük deresi the coast trends north-eastward for about 20 miles to Peronit burnu ( $41^{\circ} 22' N.$ ,  $41^{\circ} 20' E.$ ), a high point which rises steeply to Ciha tepesi, a sharp, dark mountain about feet 2,130 (649m) high, about 2 miles southward of that point. In addition to this mountain, the locality may be identified by two white patches on the neighbouring heights. *See view [68].*

**Hopa.—Facilities.—Light.**—Hopa is a small town situated on the coast about 4 miles east-north-eastward of Peronit burnu. There are two jetties at Hopa, available only for small craft, on the northern of which there is a 10-ton crane. Manganese ore is exported, and a number of lighters are available. In 1941, the population of Hopa was about 3,000. There is sea communication with İstanbul. *See view [68].*

Hopa light is exhibited, at an elevation of 75 feet (22m), from a white, circular tower with a dwelling, 39 feet (11m) in height, situated on Peronit burnu.

**Coast.**—From Peronit burnu the coast trends north-eastward for about 15 miles to the mouth of Reka Chorokh, which is described on page 413. Good marks on this stretch of coast are a waterfall, close to the village of Abislah, about  $7\frac{1}{2}$  miles north-eastward of Peronit burnu, and a conspicuous culvert, close within the coast near the village of Sarpi ( $41^{\circ} 31' N.$ ,  $41^{\circ} 33' E.$ ), about 5 miles farther north-eastward.

**Anchorage.**—Temporary anchorage can be obtained off the coast about 2 miles east-north-eastward of Vize burnu situated at the mouth of Abi-Viçe deresi about 10 miles west-south-westward of Peronit burnu.

Anchorage can also be obtained off Hopa; and off Kemalpaşa a small town about 3 miles north-eastward of Abislah. These anchorages are all more or less exposed to westerly winds and are not so good as that off the village of Sapö (page 445).

**INTERNATIONAL BOUNDARY.**—The boundary between Turkey and the U.S.S.R. reaches the sea in the vicinity of Sarpi ( $41^{\circ} 31' N.$ ,  $41^{\circ} 33' E.$ ): *see also page 412.*

**Restricted area.**—An extensive restricted area which extends west-north-westward from the coast in the vicinity of Reka Chorokh is described, together with the coast northward, on page 413.

# **APPENDIX I** **LIST OF PORTS AVAILABLE FOR UNDER-WATER REPAIRS** **With details of Largest Dry or Floating Dock or Patent Slip at each Port**

NAME OF PORT AND TYPE OF DOCK, ETC.	Length from bilge of Caisson or Mitre Post of gates at		Maxi- mum length of keel blocks (3)	Breadth of Entrance at		‡Distance { below (+) above (—) Chart datum level of				Springs rise	FLOATING DOCKS, PATENT SLIPS, &c.				REMARKS
	Coping head (1)*	Floor head (2)*		Coping (4)†	MHWS level (5)†	Sill above bottom of dock (6)	Blocks, at		Maximum depth over blocks		Lifting power (12)				
							Entrance (7)	Head (8)	Forward (10)			Aft (11)			
													feet	feet	
Gölcük: (Izmit) Floating dock	feet 626·6	feet 588·2	feet —	feet 114·7	feet 108·2 (clear)	feet —	feet —	feet —	feet —	feet 28·7	feet 28·7	tons 25 000 (as designed)	tons	Turkish Govern- ment. In 6 sections Side blocks fitted. Lifting power pro- bably not more than 22,000 tons.	
Istanbul: Floating dock	635	—	—	91·5	—	4·5	—	—	—	—	—	15,000	—	Three are also three graving docks, and seven slipways.	
Varna: Floating dock	270	249·3	—	72·2	67·0 (clear)	—	—	—	—	15·2	15·2	2,200	—	Extreme breadth 88·6 feet. Total height: 33·1 feet. There is also reported to be a small dry dock.	

● In the case of Floating Docks, Patent Slips, &c., Column (1) = Extreme Length. Column (2) Length on Blocks or Cradle.  
† In the case of Floating Docks, Column (4) = Breadth at Top. Column (5) = Breadth at bottom of Dock.  
‡ In order to find the depths on Sill, &c., the quantities in columns (6), (7) and (8), should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

## APPENDIX I—continued

**LIST OF PORTS AVAILABLE FOR UNDER-WATER REPAIRS**  
 With details of Largest Dry or Floating Dock or Patent Slip at each Port.

NAME OF PORT AND TYPE OF DOCK, ETC.	Length from bilge of Caisson or Mitre Post of gates at		Maxi- mum length of keel blocks (3)	Breadth of Entrance at		‡Distance { below (+) above (—) Chart datum level of			Springs rise	FLOATING DOCKS, PATENT SLIPS, &c.				REMARKS  (13)
	Coping head (1)*	Floor head (2)*		Coping (4)†	MHWS level (5)†	Sill above bottom of dock (6)	Blocks, at			Maximum depth over blocks		Lifting power (12)		
							Entrance (7)	Head (8)		Forward (10)	Aft (11)			
Constanța:	feet 475.6	feet —	feet —	feet —	feet 75.0 (Max. beam acceptable = 69.0 feet	feet —	feet —	feet —	feet —	feet 22.3	feet 22.3	tons 7,874	Completed 1938. An extra section can be added if re- quired.	
Galati: Floating dock	147.7	—	—	—	49.2	—	—	—	—	—	—	450	Able to take vessels of 10.7 feet draught, beam 29.5 feet. (Built 1898)	
Brăila: Floating dock	260	—	—	—	49	—	—	—	—	—	—	500	Vessels up to 30,000 tons.	
Port Il'ichevsk: Floating dock	—	—	—	—	—	—	—	—	—	—	—	—	There are reported to be four other smaller, floating docks.	
Odesa: Floating dock	—	—	—	—	—	—	—	—	—	—	—	15,000		

\* In the case of Floating Docks, Patent Slips, &c., Column (1) = Extreme Length. Column (2) Length on Blocks or Cradle.

† In the case of Floating Docks, Column (4) = Breadth at Top. Column (5) = Breadth at bottom of Dock.

‡ In order to find the depths on Sill, &c., the quantities in columns (6), (7) and (8), should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

APPENDIX I—continued

LIST OF PORTS AVAILABLE FOR UNDER-WATER REPAIRS

With details of Largest Dry or Floating Dock or Patent Slip at each Port.

NAME OF PORT AND TYPE OF DOCK, ETC.	Length from bilge of Caisson or Mitre Post of gates at		Maxi- mum length of keel blocks (3)	Breadth of Entrance at		†Distance { below (+) above (—) Chart datum level of			Springs rise	FLOATING DOCKS, PATENT SLIPS, &c.				REMARKS  (13)
	Coping head (1)*	Floor head (2)*		Coping (4)†	MHWS level (5)†	Sill Above bottom of dock (6)	Blocks, at			Maximum depth over blocks		Lifting power (12)		
							Entrance (7)	Head (8)		Forward (10)	Aft (11)			
Kherson: Floating dock	feet —	feet —	feet —	feet —	feet —	feet —	feet —	feet —	feet —	tons 6,000		Reported also two other floating docks.		
Nikolayev: Floating dock	—	—	—	—	—	—	—	—	—	—	5,000			
Sewastopol': Graving dock	745(a)	675(b)	—	153-0	123-0	35-0	—	—	—	—	—	—	At the mouth of Balta Panaiotova. Can take a vessel of 25,000 tons dia- placement.	
Zhdanov: Slipway	190-0	173-6	—	45-9 (clear)	52-5	—	—	—	—	17-0	17-0	2,000	Vessels must not ex- ceed 180 feet in length. There are also two floating docks.	

\* In the case of Floating Docks, Patent Slips, &c., Column (1) = Extreme Length. Column (2) Length on Blocks or Cradle.

† In the case of Floating Docks, Column (4) = Breadth at Top. Column (5) = Breadth at bottom of Dock.

‡ In order to find the depths on Sill, &c., the quantities in columns (6), (7) and (8), should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.  
(a) Extreme length. (b) Length on bottom.

## APPENDIX I—continued

## LIST OF PORTS AVAILABLE FOR UNDER-WATER REPAIRS

With details of Largest Dry or Floating Dock or Patent Slip at each Port.

NAME OF PORT AND TYPE OF DOCK, ETC.	Length from bilge of Caisson or Mitre Post of gates at		Maxi- mum length of keel blocks (3)	Breadth of Entrance at		;Distance { below (+) Chart datum level of				Springs rise	FLOATING DOCKS, PATENT SLIPS, &c.				REMARKS
											Maximum depth over blocks		Lifting power		
	Coping head (1)*	Floor head (2)*		Coping (4)†	MHWS level (5)†	Sill above bottom of dock (6)	Blocks, at		Forward (10)		Aft (11)	tons			
							Entrance (7)	Head (8)							
Taganrog: Wooden slipway	feet 100-0	feet —	feet —	feet —	feet —	feet —	feet —	feet —	feet —	feet —	tons 300	Hand haulage. Ves- sels must not ex- ceed 150 feet in length. (No recent information.)			
Rostov: Patent slipway	317	200	—	—	—	—	—	—	—	1-5	7-0	700	No recent informa- tion.		
Novorossiysk: Floating dock	—	—	—	—	—	—	—	—	—	—	—	18,000	Also one smaller dock, capacity 5,000 tons.		
Patent slip	—	—	—	—	—	—	—	—	—	—	—	small craft			
Port Tuapse: Floating dock	—	—	—	—	—	—	—	—	—	—	—	—	Size not known.		
Patent slip	—	—	—	—	—	—	—	—	—	—	—	—	Size not known.		
Port: Floating dock	—	—	—	—	—	—	—	—	—	—	—	9,000			

\* In the case of Floating Docks, Patent Slips, &amp;c., Column (1) = Extreme Length. Column (2) Length on Blocks or Cradle.

† In the case of Floating Docks, Column (4) = Breadth at Top. Column (5) = Breadth at bottom of Dock.

‡ In order to find the depths on Sill, &amp;c., the quantities in columns (6), (7) and (8), should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

## APPENDIX II

Port or Anchorage	List of Ports and Anchorages with some particulars						
	Lat. North	Long. East	Page	Depth below Chart Datum		Average Tidal Rise	Type of Berth
				In Approach	In Anchorage		
<b>TURKEY:</b>							
Çanakkale	40° 09'	26° 24'	90	Deep	60 feet	Nil (see page 37)	Vessels up to 7,000 tons at wharf 42 and 30 feet alongside (vessel not exceeding 250 feet long.
Gelibolu	40° 25'	26° 41'	97	Deep	78 feet	"	Pier, with 26 feet alongside
Tekirdağ	40° 58'	27° 31'	104	Deep	36 feet	"	—
Silivri liman	41° 03'	28° 16'	106	Deep	48 feet	"	Quay: 12 feet alongside
Karabiga limanı	40° 24'	27° 19'	109	Deep	36 feet	"	—
Erdék limanı	40° 23'	27° 47'	111	Deep	60 feet	"	Good anchorage: Open eastward and north-eastward. Good capacious anchorage.
Pasa Limanı harbour	40° 31'	27° 36'	115	Deep	48 feet to 12 fathoms	"	Good sheltered anchorage for several large vessels.
Bandırma limanı	40° 21'	27° 58'	121	Deep	66 feet	"	Good anchorage except in north-easterly winds.
Mudanya	40° 27'	28° 52'	125	Deep	20 fathoms	"	Indifferent, exposed anchorage.
Gemlik	40° 26'	29° 09'	126	Deep	14 fathoms	"	Open anchorage, good holding ground.
Gölcük	40° 44'	29° 48'	134	Deep	45 feet	"	Swinging space limited.
Derince	40° 45'	29° 50'	134	Deep	50 feet	"	Commercial port open to westerly gales.
Izmit	40° 46'	29° 55'	134	Deep	45 feet	"	Good anchorage, open to westerly winds.
Haydarpaşa	41° 00'	29° 01'	137	51 feet	50 feet	"	Terminus of Izmit railway, 4,700 feet of quaysage.

## APPENDIX II—continued

Port or Anchorage	List of Ports and Anchorages with some particulars							
	Lat. North	Long. East	Page	Depth below Chart Datum		Average Tidal Rise	Type of Berth	Remarks
				In Approach	In Anchorage			
<b>TURKEY—continued</b>								
Istanbul . . .	41° 01'	28° 59'	137	Deep	36 to 50 feet	Nil (see page 37)	Quays	Between Fenerbahçe bankı and Kız kullesi; good holding ground. Off Tophane. Buoys in harbour. Depths of 16-30 feet alongside quays. Anchorage in Büyükdere limanı in 18-24 fathoms.
<b>BULGARIA:</b>								
Burgas . . .	42° 29'	27° 29'	179	Deep	31 to 39 feet	"	Quays	Vessels drawing up to 29½ feet can berth alongside.
Varna . . .	43° 11'	27° 56'	182	Deep	42 feet	"	Quays	Vessels drawing 26 to 30 feet can berth at quays.
<b>RUMANIA:</b>								
Mangalia . . .	43° 49'	28° 37'	188	Deep	48 feet	"	"	Open anchorage.
Constanța . . .	44° 10'	28° 39'	189	Deep	58 to 66 feet	"	Quays	Vessels drawing up to 31 feet can berth alongside (1969).
<b>RUMANIA:</b> ( <i>River Danube</i> )								
Sulina . . .	45° 09'	29° 39'	199	22 feet*	42 to 48 feet	"	Quays, depths of 24 feet alongside	*(1969) dredged channel liable to change.
Galați . . .	45° 25'	28° 05'	206	About 22 feet	—	"	Quays: 27 to 36 feet*	*Depending on state of river.
Brăila . . .	45° 15'	27° 59'	207	About 22 feet	—	"	Quays: 24 feet	Limit of navigation for sea-going vessels.
<b>U.S.S.R. (<i>River Danube</i>)</b>								
Reni. . .	45° 26'	28° 18'	206	About 22 feet	—	"	Quays	Quays for vessels drawing up to 19½ feet (variable).

# APPENDIX II—continued

List of Ports and Anchorages with some particulars								
Port or Anchorage	Lat. North	Long. East	Page	Depth below Chart Datum		Average Tidal Rise	Type of Berth	Remarks
				In Approach	In Anchorage			
<i>U.S.S.R. (River Danube):</i> <i>—continued</i>								
Izmail . . .	45° 20'	28° 51'	208	33 to 59 feet	16 to 49 feet	Nil (see page 37)	Wharves .	Large river port.
Kiliya . . .	45° 26'	29° 16'	208	17 feet	—	"	Quays .	Depths (1967) 18 to 21 feet at Quays.
<i>U.S.S.R.:</i>								
Port Belgorod-Dnestrovsky . .	46° 11'	30° 21'	213	8 feet on bar; channel dredged to 10 feet (1968)*	30 feet**	"	Wharves: about 7 feet alongside	*Depths in dredged channel varies up to about 7 feet. **Outer anchorage.
Port Il'ichevsk . . .	46° 18'	30° 39'	216	40 feet*	—	"	Quays: depths 30 to 32 feet (1967)	* (1967)—Variable. Limiting draught 30 feet.
Odeskiy port . . .	46° 29'	30° 45'	219	43½ feet*	30 to 70 feet	Range of water level 0m6 (page 220)	Four separate harbours. See text	* (1968)—Dredged channel to Petroleum harbour. 27 to 33 feet in outer harbours. Main base of U.S.S.R. Black Sea fleet.
Ochakovskiy Trading harbour . . .	46° 37'	31° 32'	236	34 feet*	—	(See page 233)	Mole: 8 to 14 feet alongside	* (1968)—Dredged channel 16½ feet in harbour.
Kherson . . .	46° 37'	32° 36'	242	27 feet*	30 to 40 feet	"	Quays: Up to 24 feet alongside (1967)	* (1968)—Dredged channel; varies in depth and width.
Nikolayev . . .	46° 59'	31° 58'	251	26 feet*	25 feet	Range of water level 0m9 (See page 244)	Over 10,000 feet of Quays: 16 to 23 feet (1946)	* (1960)—Maximum draught for which channel was available. Port not open to foreign vessels. No recent information.
Skadovsk . . .	46° 06'	32° 55'	262	15½ feet*	25 feet in basin	Nil (see page 37)	Pier . . .	* (1958)—No recent information.



## APPENDIX II—continued

List of Ports and Anchorages with some particulars								
Port or Anchorage	Lat. North	Long. East	Page	Depth below Chart Datum		Average Tidal Rise	Type of Berth	Remarks
				In Approach	In Anchorage			
<i>U.S.S.R.—continued</i>								
Port Khorly . . . . .	46° 05'	33° 16'	263	11 feet*	22 feet in basin (1938) 23 to 29 feet	Nil (see page 37)	Wharves .	*(1947)—Dredged channel. No recent information. Secure anchorage sheltered from westerly and southerly winds. Anchorage untenable in strong westerly winds.
Bakal'skaya bukhta . . . . .	45° 45'	33° 13'	264	14 feet (1966) Deep	36 to 45 feet	—	—	
Bukhta Yarylgach . . . . .	45° 35'	32° 49'	259	Deep	9 to 25 feet	—	Open .	Exposed north-westerly. Rarely freezes.
Ak-Mechetskaya bukhta . . . . .	45° 31'	32° 42'	258	Deep	30 to 33 feet	—	Open .	Open from south-east to west-south-west.
Yevpatoriyskaya bukhta . . . . .	45° 11'	33° 22'	268	Deep	18 to 54 feet	—	—	Closed to foreign vessels. U.S.S.R. Naval base.
Sevastopol'skaya bukhta . . . . .	44° 37'	33° 22'	275	Deep	42 feet	Nil	—	—
Balaklavskaya bukhta . . . . .	44° 29'	33° 36'	280	25 fathoms	60 feet and above	—	Open .	—
Yaltinskiy port . . . . .	44° 29'	34° 10'	285	Deep	48 to 60 feet	Range of water level 0m6 (page 294)	Quays: 19 to 23 feet alongside	Artificial harbour: two breakwaters.
Feodosiyskiy port . . . . .	45° 03'	35° 25'	294	Deep	—	Nil	—	
Kamyah-Burunakiy port . . . . .	45° 16'	36° 25'	307	6m2*	—	Nil	—	*(1958)—Dredged channel. Developments in hand (1966).
Kerch' . . . . .	45° 21'	36° 28'	316	6m2*	—	Nil	Quays: 2m4 to 4m6 alongside	*(1966)—Dredged channel; available for ships of 5m2 draught.



## APPENDIX II—continued

Port or Anchorage	List of Ports and Anchorages with some particulars							
	Lat. North	Long. East	Page	Depth below Chart Datum		Average Tidal Rise	Type of Berth	Remarks
				In Approach	In Anchorage			
U.S.S.R. ( <i>Black Sea</i> )— <i>continued</i>								
Novorossiyskiy port	44° 44'	37° 47'	378	Deep	12 to 13 fathoms	Nil ( <i>see page</i> 37)	Extensive quays 17 to 36 feet along- side.	Best equipped harbour on Caucasian coast. Never freezes. Anchorage dangerous in autumn and winter.
Bukhta Gelendzhikskaya	44° 33'	38° 03'	385	Deep	31 feet	"	—	Small bay; exposed S.W.
Port Tuapse	44° 05'	39° 04'	391	Deep	15 metres	"	Quays: 4m5 to 9m0 alongside	Artificial harbour. Unsafe in "Tyagun" (page 000).
Sochi	43° 35'	39° 44'	396	Deep	31 feet	"	Open anchorage	Open from north-west to south-east. Unsafe in southerly winds.
Sukhumi	43° 10'	41° 02'	403	Deep	18 fathoms	"	Open anchorage	—
Port Poti	42° 09'	41° 39'	408	Deep	25 metres and above	Range of water level 0m6 ( <i>see</i> page 410)	Quays: 5m2 to 7m6 alongside	Artificial harbour.
Batumi	41° 39'	41° 39'	411	Deep	10 to 20 metres	Nil ( <i>see page 37</i> )	Quays: 3m0 to 9m3 alongside	Important oil port and shipping exit for Baku and Caucasian oilfields.
TURKEY ( <i>Anadolu</i> <i>coast</i> ):								
Ereğli limanı	41° 17'	31° 24'	421	Deep	36 feet	<i>See page 37</i>	Quays: 18 to 30 feet alongside	Artificial harbour.
Zonguldak	41° 27'	31° 47'	424	Deep	60 to 80 feet	"	Quays: 23 to 33 feet alongside	Artificial harbour. Unsafe in strong winds from N.E. through N. to W.
Amasra	41° 45'	32° 23'	426	Deep	36 to 60 feet	"	One small jetty	Small artificial harbour.
İnebolu	41° 59'	33° 46'	429	Deep	50 feet	"	Small jetty in harbour.	Small artificial harbour.

# APPENDIX II—*continued*

List of Ports and Anchorages with some particulars								
Port or Anchorage	Lat. North	Long. East	Page	Depth below Chart Datum		Average Tidal Rise	Type of Berth	Remarks
				In Approach	In Anchorage			
<b>TURKEY (<i>Anadolu coast</i>)—<i>continued</i></b>								
Sinop . . . . .	42° 00'	35° 09'	431	Deep	30 to 60 feet	Nil ( <i>see page 37</i> )	One small jetty	Open anchorage. Safest natural anchorage between Bosporus and Batumi.
Gerze . . . . .	41° 47'	35° 12'	432	Deep	18 to 42 feet	"	—	Open anchorage.
Samsun . . . . .	41° 18'	36° 21'	433	Deep	20 to 26 feet Inner anchorage 24 to 60 feet in Outer anchorage.	"	Quay area dredged to 36 feet (1962)	Artificial harbour.
Ünye Körfezi . . . . .	41° 09'	37° 18'	435	Deep	24 feet	"	—	Open anchorage.
Perşembe limanı . . . . .	41° 04'	37° 47'	437	Deep	30 feet upwards	"	—	Good anchorage; open.
Giresun . . . . .	40° 55'	38° 23'	438	Deep	30 to 60 feet	"	Quays: 39 to 42 feet	Artificial harbour.
Tirebolu . . . . .	41° 01'	38° 49'	440	Deep	36 to 48 feet	"	—	Open anchorage.
Akcaabat . . . . .	41° 02'	39° 36'	441	Deep	60 feet to 15 fathoms	"	—	Good, open anchorage.
Trabzon . . . . .	41° 00'	39° 45'	441	Deep	12 to 16 fathoms	"	Quays: 30 feet alongside	Open to all northerly winds. Artificial harbour. Unsafe in strong northerly winds.
Rize . . . . .	41° 03'	40° 32'	444	Deep	30 feet	"	—	Open to all northerly winds.
Ardeşen . . . . .	41° 15'	41° 04'	445	Deep	33 feet	"	—	Ore-loading anchorage. Lighters available.

## APPENDIX III

## REPORTED RADAR RANGES

The following table, which has been prepared by the United Kingdom Chamber of Shipping, gives the ranges at which echoes have been observed under normal conditions:—

Radar Target and Page of Pilot	Echo range in miles			Remarks
	Poor	Good	Identi- fiable *	
Aytodor, Mys (p. 284) . . . . .	—	20	—	
Ayu-Dag, Mys, (p. 287) . . . . .	28	—	—	
Ayya, Mys (p. 281) . . . . .	—	22	—	
Baba burnu (p. 106) . . . . .	—	21	—	
Bol'shoi Fontan, Mys (p. 218) . . . . .	—	22	—	
Boz tepe: Trabzon (p. 442) . . . . .	—	12	—	
Doob, Mys (p. 379) . . . . .	—	11	—	
Ereğli burnu (p. 106) . . . . .	—	23	—	
Haydarpaşa (p. 149) . . . . .	—	12	—	
Idokopas, Mys (p. 388) . . . . .	—	28	—	
Kaliakra, Nos (p. 185) . . . . .	30	—	—	
Kerempe burnu (p. 428) . . . . .	—	8	—	
Khersones, Mys (p. 270) . . . . .	—	21	—	
Meganom, Mys (p. 289) . . . . .	—	28	—	
Penay, Mys (p. 379) . . . . .	—	6	—	
Samsun (p. 433) . . . . .	—	12	—	
Singhol, Capul (p. 190) . . . . .	—	23	—	
Sinop burnu (p. 431) . . . . .	—	12	—	
Sinop roadstead (p. 431) . . . . .	—	12	—	
Tarkhankut lighthouse (p. 257) . . . . .	—	12	—	
Utrish, Ostrov (p. 376) . . . . .	—	12	—	
Zonguldak burnu (p. 424) . . . . .	—	14	—	

\* *Identifiable with charted features from the shape and character of the echo.*

# VIEWS



[1] (pages 165, 419).



*Şile.  
Tower.  
(Lighthouse not shown and town no longer surrounded by wall).*

Şile, bearing 200°, 3½ miles.  
(Original dated 1844.)



[2] (page 171).



View, in 2 parts, of coast in vicinity of Midiye.  
(Original dated 1844.)

[3] (page 172).



*Beyendik burnu.*

Vicinity of Beyendik burnu.

[4] (page 172).



*Mt. Papiya.*

Vicinity of Akhtopol from south-eastward.

(Original dated 1844.)

*Akhtopol.*

[5] (page 172).



*Mt. Papiya.*

*Michurin,*  
*bearing 227°, 6 miles.*

Vicinity of Michurin from north-eastward.  
(Original dated 1844.)

[6] (page 175).

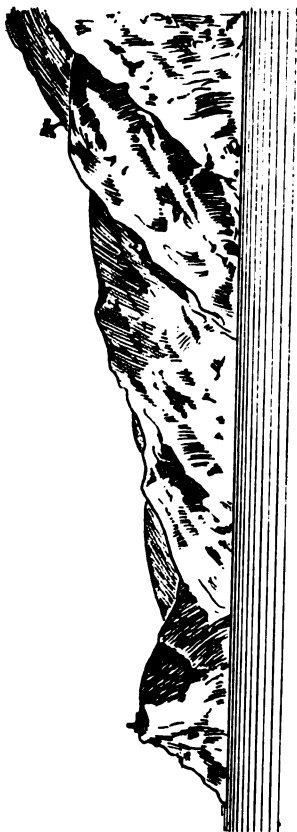


*Sozopol,*  
*bearing 260°, 3½ miles.*

Vicinity of Sozopol from eastward.  
(Original dated 1844.)

*Sveti Iovan.*

[7] (page 177).



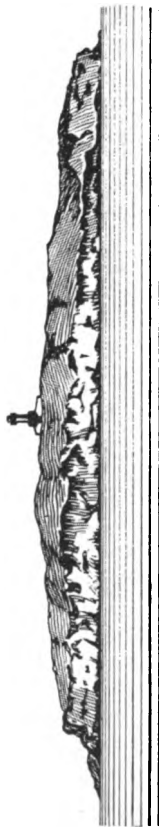
Nos Emine bearing  $183^{\circ}$  distant one mile.  
(Original dated 1937.)

[8] (page 185).



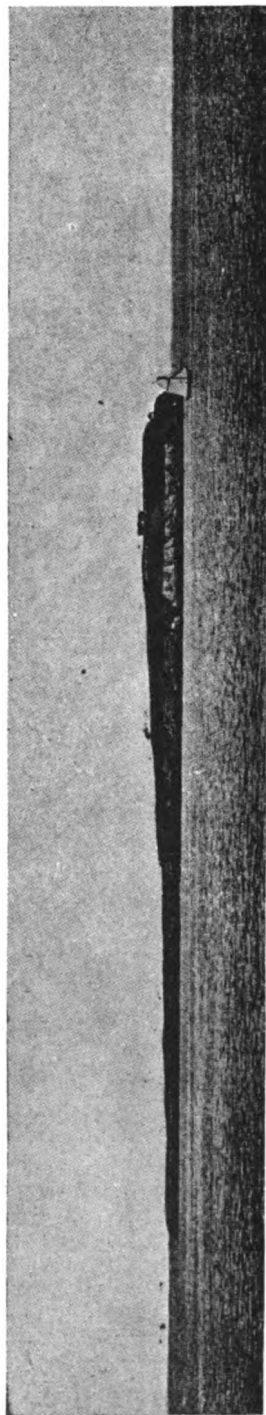
Kavarna,  
bearing  $005^{\circ}$ ,  $7\frac{1}{4}$  miles.  
Vicinity of Kavarna from southward.  
(Original dated 1844.)

[9] (page 211).



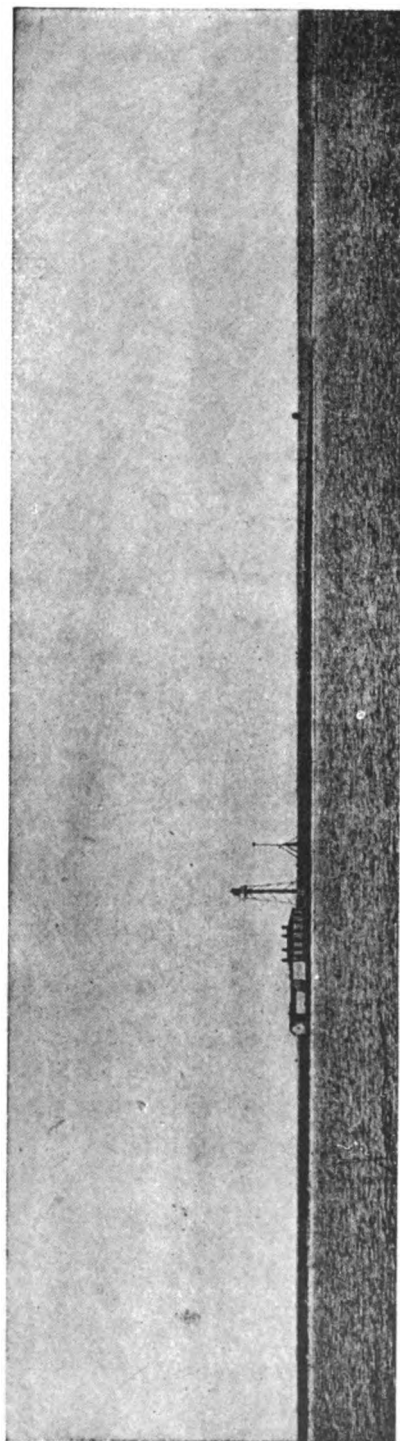
Ostrov Zmeinyy from north-north-eastward.  
(Original dated 1942.)

[10] (page 230).



Ostrov Berezan', bearing 004°, three-quarters of a mile.  
(Original dated 1915.)

**[11] (page 256).**



*(Beacon removed.)*

**Dzharylgachskiy lighthouse, bearing 331°, 1¼ miles.**

*(Original dated 1915.)*

[12] (pages 270, 279, 280).



*Mys Ayva.*

*Mys Feolent.*

*Khersones old lighthouse (destroyed 1943) bearing 137°  
(The present lighthouse is a framework structure.)*

Vicinity of Mys Khersones from north-westward.  
(Original dated 1937.)

[13] (pages 270, 279).



*Sevastopol'.*

*Mys Ayva.*

*Mys Feolent.*

Coast between Sevastopol' and Mys Khersones.  
(Original dated 1844.)

*Khersones Lt. Ho.  
bearing 178°, 9½ miles*

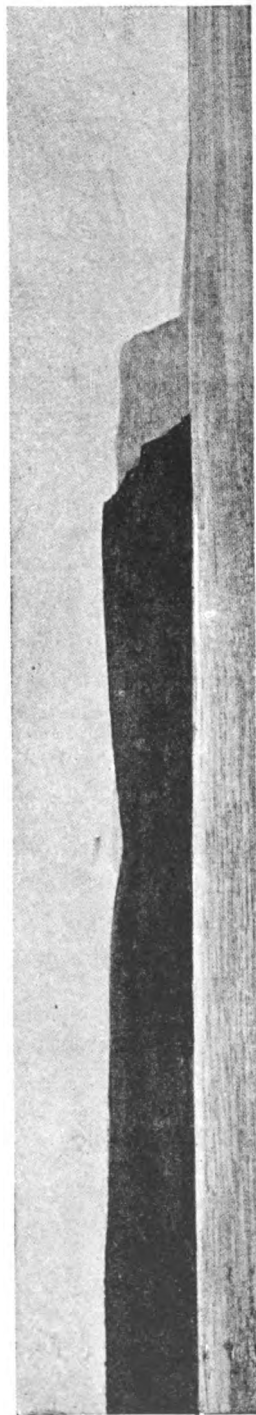
[14] (*pages 271, 275*).



Sevastopol', bearing  $110^{\circ}$ , 4 miles.  
(*Original dated 1844*.)



[15] (pages 271, 280).



*Mys Ayya*

Mys Feolent, bearing  $121^{\circ}$ , three-quarters of a mile.  
(Original dated 1915.)

[16] (pages 271, 280).



*Mys Feolent.*

Mys Feolent from south-south-eastward.  
(Original dated 1837.)

Simatorium (St. Georges' monastery),  
bearing  $339^{\circ}$ , 8 miles.

[17] (pages 271, 280).

*Beloklitskaya bukhta*  
bearing  $074^{\circ} 7.2$  miles.

*Sanatorium.*

*Mys Feolent.*

*Mys Ayya.*

*Mys Sarych.*

Coast from Mys Feolent to Mys Sarych.

(Original dated 1961.)

[18] (pages 271, 279, 281).

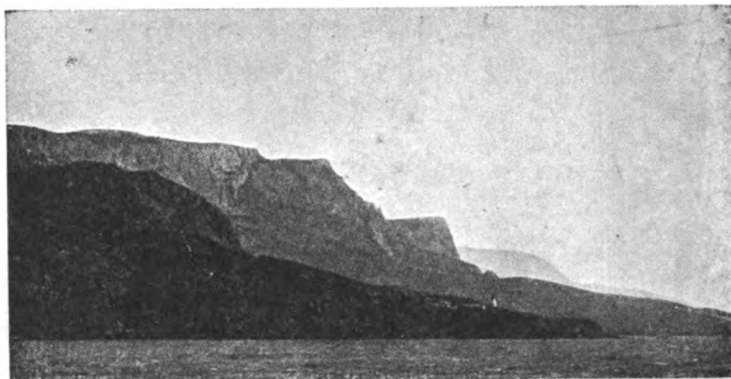


*Mys Sarych.*

*Mys Ayya*, bearing  $113^{\circ}$ , one mile.

(Original dated 1915.)

[19] (*page 282*).

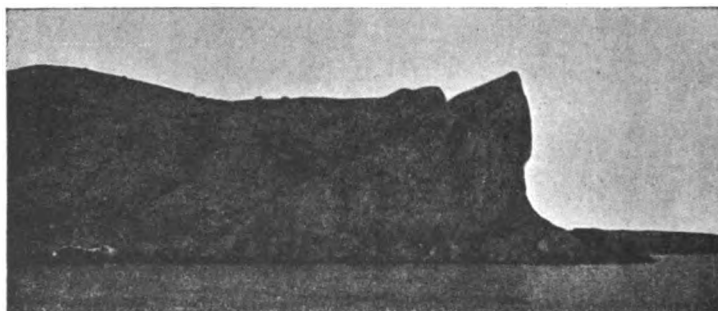


*Lighthouse.*

**Mys Sarych lighthouse, bearing 075°,  
three-quarters of a mile.**

*(Original dated 1915.)*

[20] (*page 290*).



**Mys Alchak-Kaya, bearing 085°, half a mile.**

*(Original dated 1915.)*

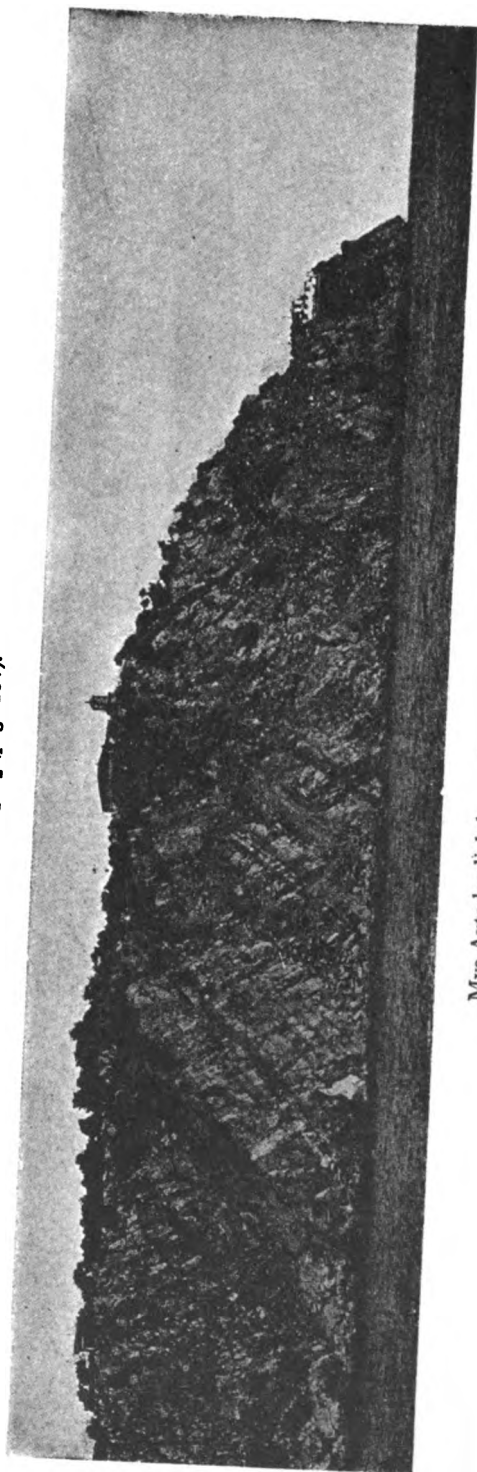
[21] (pages 284, 287).



*Mys Aytodor,*  
bearing 039½°, 8 miles.  
*Mys Aytodor and Mys Ayu-Dag from south-westward.*  
(Original dated 1937.)

[22] (page 284).

*Mys Ayu-Dag,*  
bearing 046½°, 20 miles.



*Mys Aytodor lighthouse, bearing 049°, half a mile.*  
(Original dated 1915.)

[23] (page 287).



*Mys Ayu-Dag.*

Mys Ayu-Dag, bearing  $020^{\circ}$ , 5 miles.  
(Original dated 1937.)

[24] (pages 287, 288).



*Khokh Kastel'.*

Gora Chatyr Dag,  
Alushta,  
bearing  $317^{\circ}$ ,  $9\frac{1}{2}$  miles.  
Vicinity of Alushta from south-eastward.  
(Original dated 1844.)

[25] (page 290).



*Eski-Dag.*

*Kara-Dag.*

Coast between Sudakskaya bukhta and Mys Meganom.  
(Original dated 1844.)

*Mys Meganom,  
bearing 062°, 7 miles.*

[26] (page 290, 291).



*Mys Meganom,  
bearing 250°, 12½ miles.*



*Kara-Dag.*



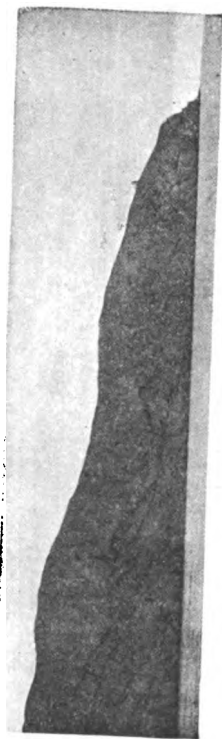
*Mys Il'i.*

*Mys Kiti-Atlanaj,  
bearing 016°, 6 miles.*

View, in 3 parts, of coast between Mys Meganom and Mys Il'i.

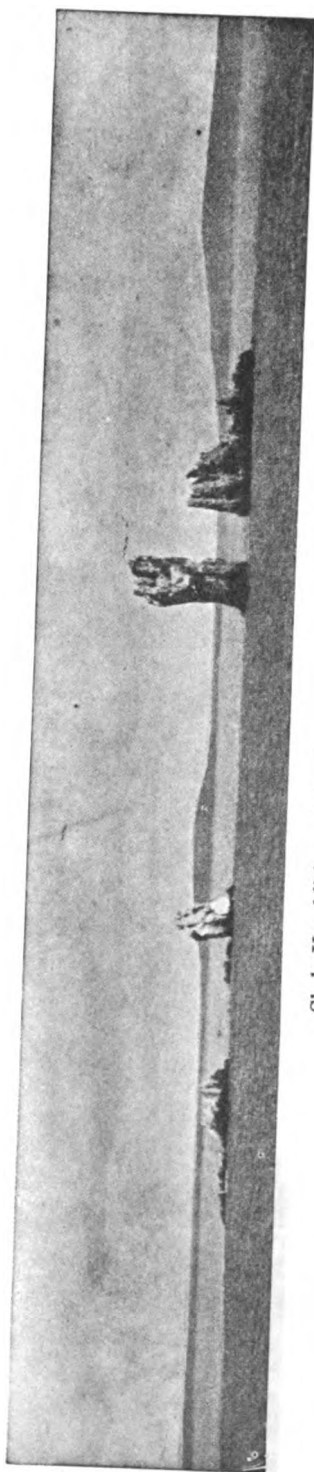
(Original dated 1844.)

[27] (page 293).



Mys Il'i, bearing: 300°, one mile.  
(Original dated 1915.)

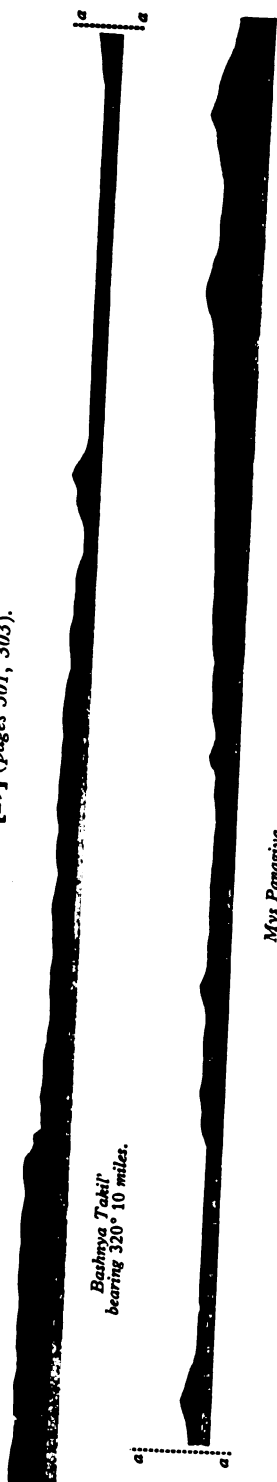
[28] (page 296).



Skala Korabl'-kamen' bearing 357°, a quarter of a mile.  
*Light structure not shown.*  
(Original dated 1915.)



[29] (pages 301, 303).



*Mys Panagiya,*  
bearing 006°, 10½ miles.

View, in 2 parts, of southern entrance to Kerchenskiy proliv.  
(Original dated 1844.)

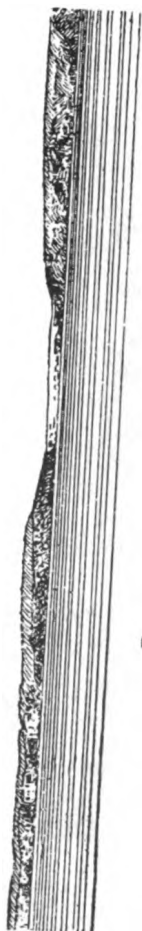
[30] (pages 310, 335).



*Mys Pekly, Mys Kamenny*  
bearing 120°, about 1½ miles.

Mys Kamenny and Mys Pekly from west-north-westward.  
(Original dated 1937.)

[31] (page 323).



Pasur village, bearing  $145^{\circ}$ ; 2 miles.  
(Original dated 1937.)

[32] (page 349).



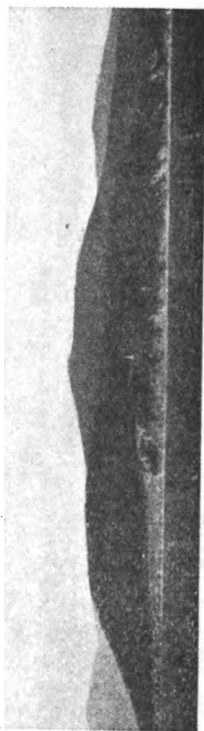
Port Zhdanov; view from Ugol'naya Gavan' approach channel.  
(Original dated 1964.)

[33] (page 377).



Mys Myskhako, bearing 078°, 11 miles.  
(Original dated 1937.)

[34] (page 379).



*Lighthouse.*  
Doobakiy lighthouse, bearing 090°, half a mile.  
(Original dated 1915.)

[35] (page 387).



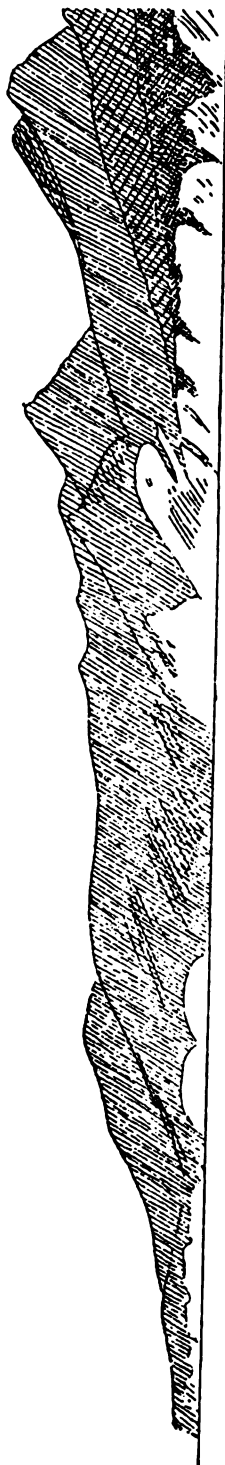
Gora Tshungochuk.

Reka Dzhanhot.

Coast north-westward of Mys Idokopas.  
(Original dated 1844.)

Mys Idokopas,  
bearing 094°, 6½ miles.

[36] (pages 387, 388).



Mys Idokopas,  
bearing, 296°, 9½ miles.

Mys Chugovkopas,  
3½ miles.

Mys Idokopas from east-south-eastward.  
(Original dated 1937.)

[37] (page 388).

*Gora Thhachegochuk.**Mys Chugoutopai,  
bearing 327°, 9½ miles.**Gora Bigius.**Mouth of Reka Vulkan,  
bearing 013°, 8½ miles.*

View, in 3 parts, of coast adjacent to the mouth of Reka Vulkan.  
(Original dated 1844.)

[38] (*page 389*).



*Mouth of Reka Shapubho,  
bearing 353°, 4½ miles.*

*Tenginskaya bukhta.  
(Original dated 1844.)*

[39] (page 390).



*Gera Lyaya.*

*Mys Tu.*

Coast north-westward of Mys Tu.  
(Original dated 1844.)

[40] (pages 373, 390).

*Gera Lyaya.*



*Mys Tu,*  
bearing 327°, 13½ miles.

*Mys Kodoah.*

Coast between Mys Tu and Mys Kodoah.  
(Original dated 1844.)

[41] (page 391).

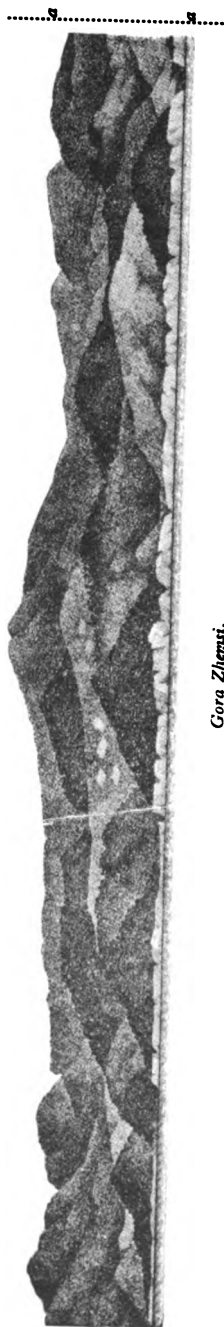


*Lighthouse.*

Kodoshkiy lighthouse, bearing 350° half a mile.  
(Original dated 1915.)



[42] (pages 373, 395).



*Gora Zhemsi.*

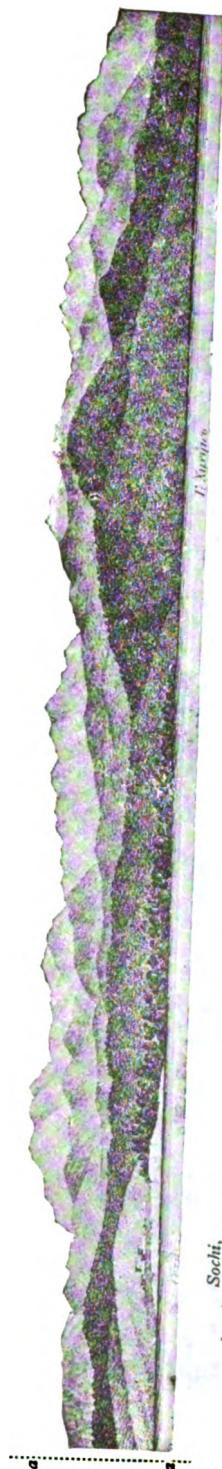


*Mouth of Reka Shakhe,  
bearing 058°, 3½ miles.  
View, in 2 parts, of vicinity of Reka Shakhe.  
(Original dated 1844.)*

[43] (page 396).



*Gora Shugus.*

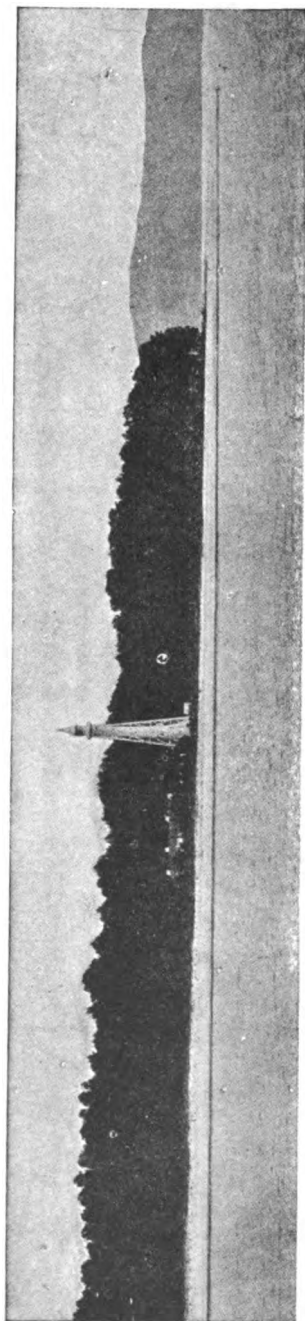


*Sochi,  
bearing 082°, 31 miles*

*Gora Khukhup.*

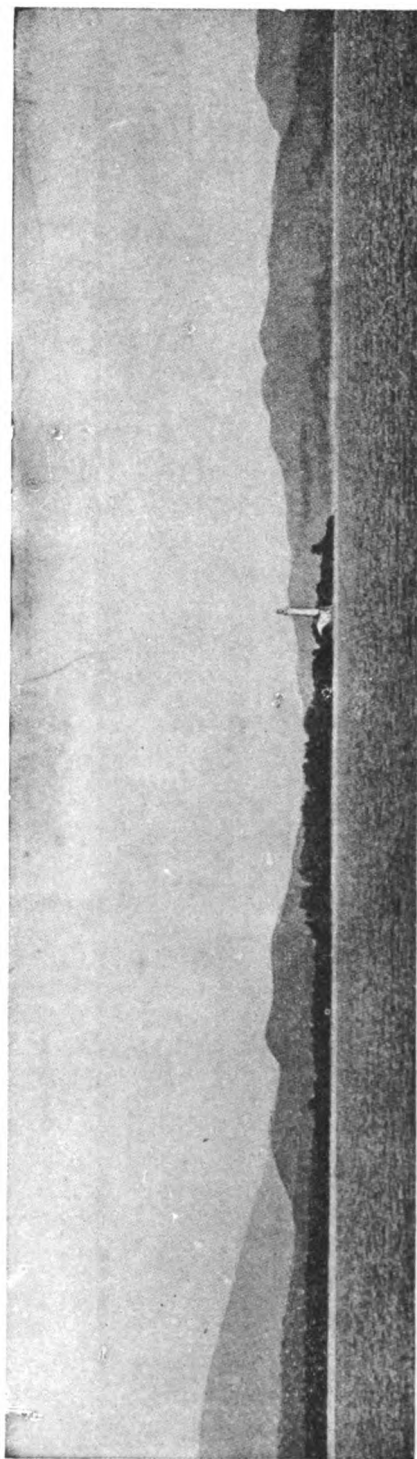
View, in 2 parts, of vicinity of Sochi.  
(Original dated 1844.)

[44] (page 400).



Pitsundskiy lighthouse, bearing 021°, half a mile.  
(Original dated 1915.)

[45] (page 403).



Sukhumiyakiy lighthouse, bearing 068°, three-quarters of a mile.  
(Original dated 1915.)

[46] (pages 404, 407).



*Redut-Kale.*  
*Gora Olen'.*

*Gora Poti.*

Redut-Kale, bearing  $054^{\circ}$ ,  $2\frac{1}{2}$  miles.  
(Original dated 1844.)

[47] (page 413).



*Zemo Tamary.*

*Batumi.*  
bearing  $170^{\circ}$ , 3 miles.  
Approach to Batumi from northward.  
(Original dated 1844.)

[48] (page 420).

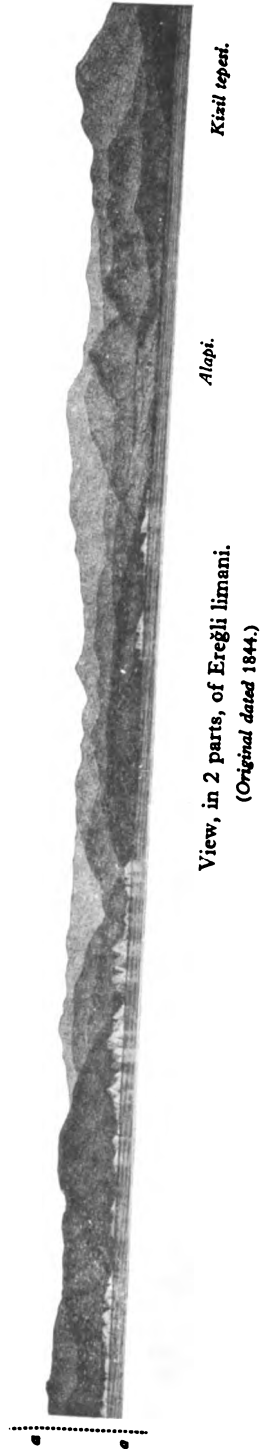


*Kefken adasi,  
bearing 107° 5 miles.  
(Lighthouse not shown.)*

*Vicinity of Kefken adasi.  
(Original dated 1844.)*

*Mount Kirpen.*

[49] (page 421).



[50] (page 421).



Körsadzi.

Vicinity of Baba burnu: Ereğli limane.  
(Original dated 1844.)

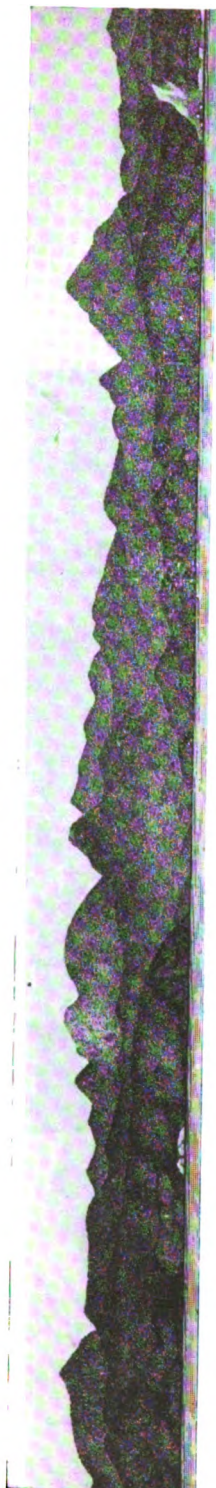
Baba burnu,  
bearing 159° 51' miles.  
Kızıl tepesi.

[51] (page 424).



Zonguldak burnu from south-westward.  
(Original dated 1942.)

[52] (page 428).



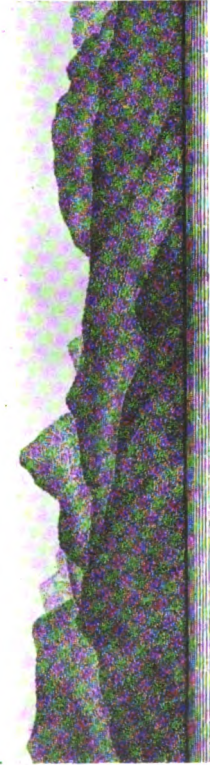
Gebeçli tepesi.  
Cide.

Coast in the vicinity of Cide.  
(Original dated 1844.)

Mouth of İrmak cayı,  
bearing 132°, 7½ miles.



[53] (page 428).



*Gebeoğlu tepesi.*      *Köpek kayası burnu.*  
Gebeoğlu tepesi, bearing  $215^{\circ}$ ,  $13\frac{1}{2}$  miles.  
(Original dated 1844.)

[54] (page 428).

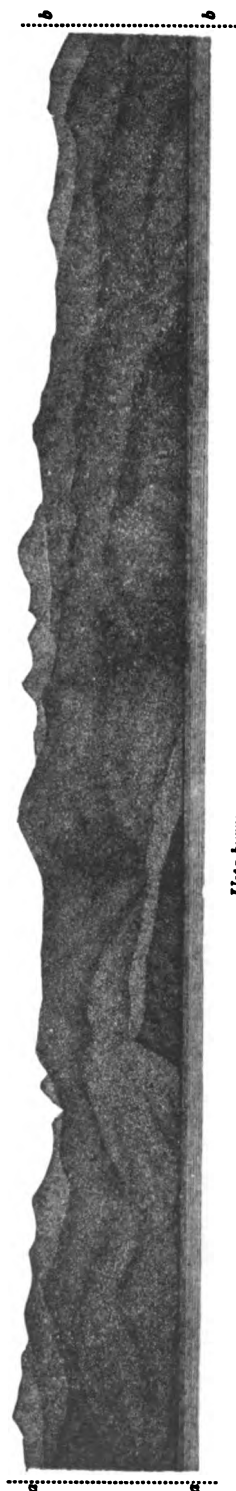


*Kayran.*      *Meset.*  
Coast eastward of Kerempe burnu.  
(Original dated 1915.)  
*Kerempe burnu,*  
bearing  $243^{\circ}$ ,  $14\frac{1}{2}$  miles.

[55] (page 430).



*Mouth of  
Ayancik deresi,  
bearing 154°, 8½ miles.*

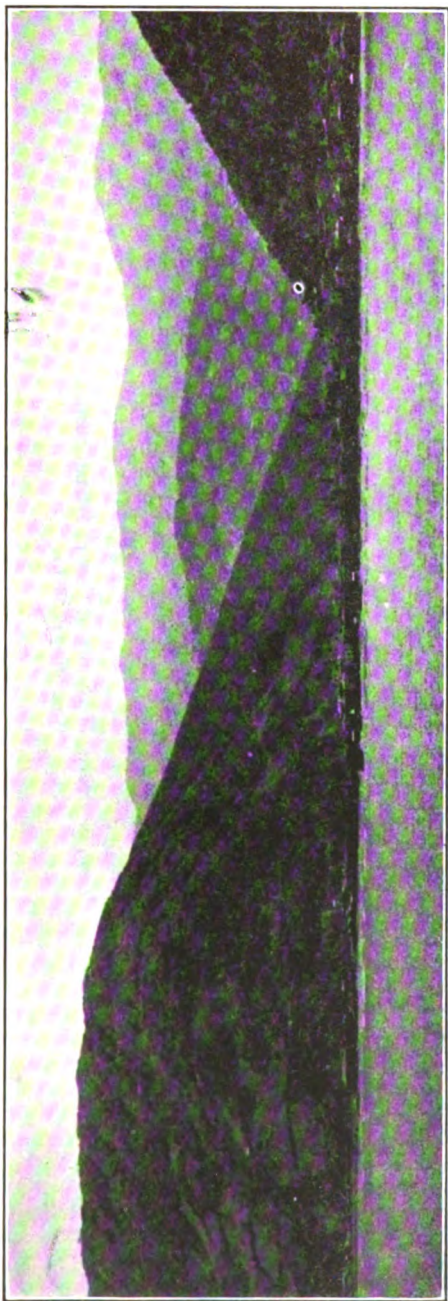


*Usta burnu,  
bearing 192°, 5½ miles.*

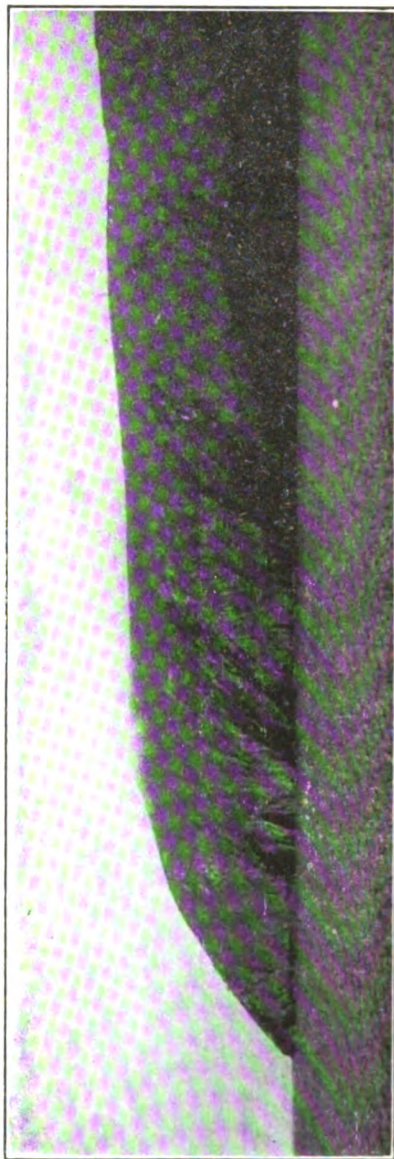


*Ayancik burnu,  
bearing 225°, 10½ miles.  
View, in 3 parts, of vicinity of Usta or Istafan burnu.  
(Original dated 1844.)*

[56] (page 430).

Ayancik from northward.  
(Original dated 1942.)

[57] (page 431).

Sinop burnu from westward.  
(Original dated 1942.)

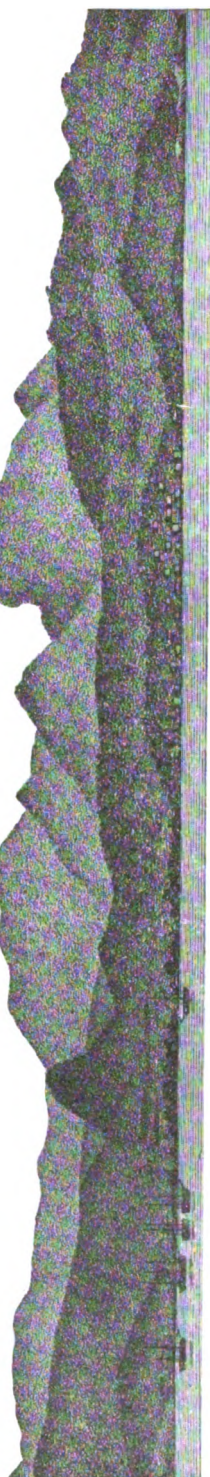
[58] (page 431).



*Pakvoz burnu,*  
bearing  $130^{\circ}$ ,  $3\frac{1}{2}$  miles.

Sinop from north-westward.  
(Original dated 1937.)

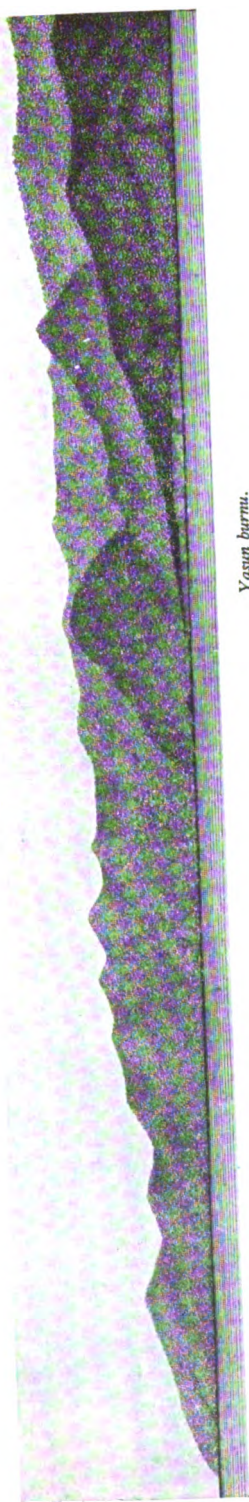
[59] (page 436).



*Unye.*  
Unye, bearing  $237^{\circ}$ , 4 miles.  
(Original dated 1844.)



[60] (page 436).

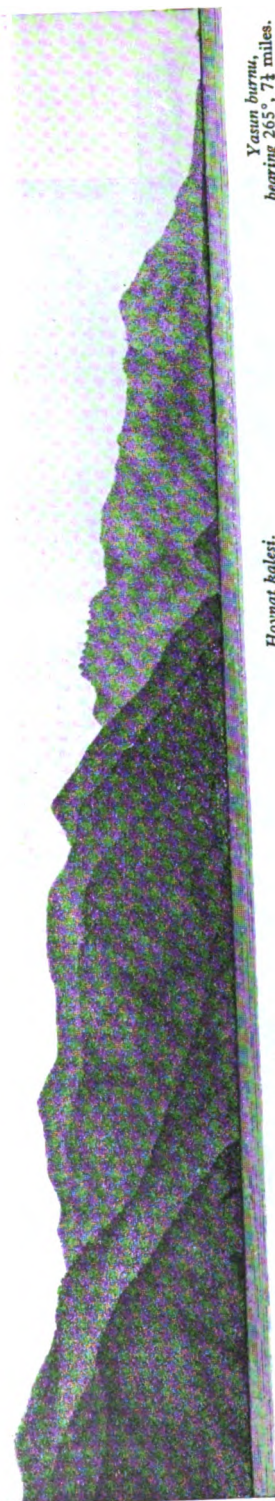


*Çam burnu,*  
bearing  $118^{\circ}$ ,  $10\frac{1}{2}$  miles.

*Yasun burnu.*

Coast between Yasun burnu and Çam burnu, from north-westward.  
(Original dated 1844.)

[61] (pages 436, 437).



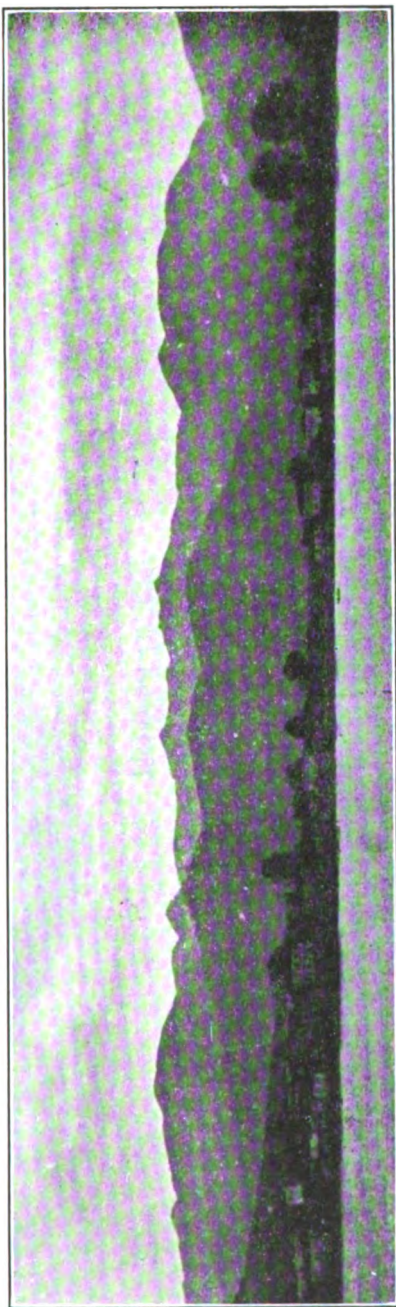
*Çam burnu.*

*Hoynat kalesi.*

Coast between Yasun burnu and Çam burnu, from eastward.  
(Original dated 1844.)

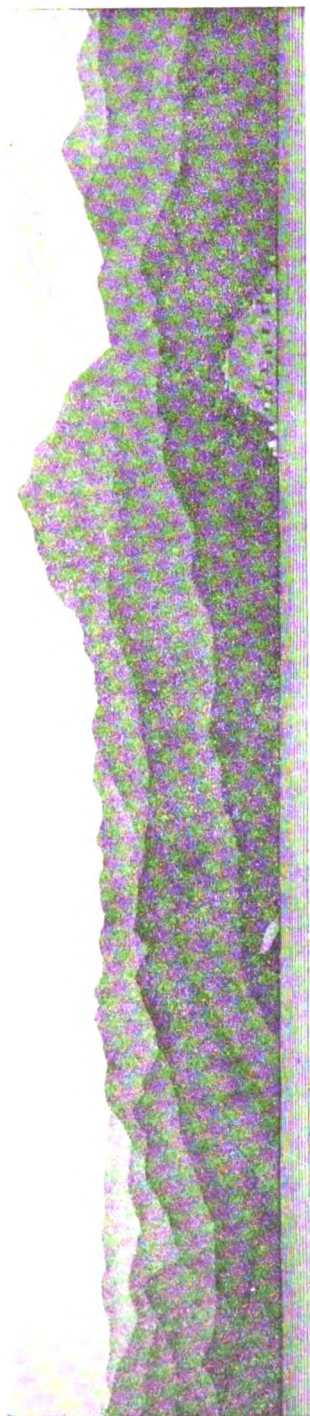
*Yasun burnu,*  
bearing  $265^{\circ}$ ,  $7\frac{1}{2}$  miles.

[62] (*page 436*).



Head of Fatsa körfezi from northward.  
(*Original dated 1942.*)

[63] (pages 437, 438).

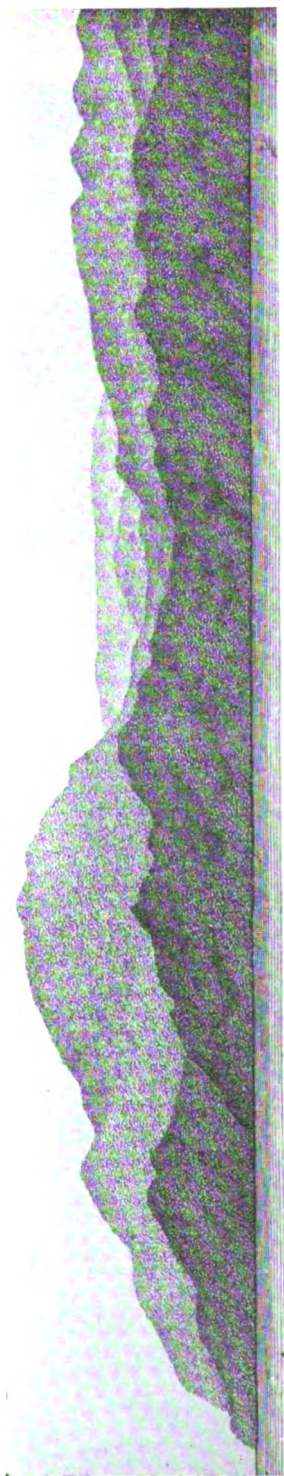


*Giresun adası.*

*Cal daşı. Giresun.*  
*bearing 197°, about 22 miles.*

Coast in the vicinity of Giresun, from north-north-eastward.  
(Original dated 1844.)

[64] (pages 437, 438).



*Sis daşı.*  
*bearing 117°, 30 miles.*

Coast eastward of Giresun from north-westward.  
(Original dated 1844.)



[65] (page 441).



*Isikli burnu,*  
bearing  $103^{\circ}$ ,  $18\frac{1}{2}$  miles.

Coast westward of Isikli burnu.  
(Original dated 1844.)

[66] (page 441).



*Akçakale*

Coast eastward of Isikli burnu.  
(Original dated 1844.)

*Isikli burnu,*  
bearing  $273^{\circ}$ , 19 miles.



[67] (page 444).



*Piryoş burnu.*  
Rize, 7 miles.  
bearing 188°  
*Mt. İohannis.*  
*Ayana tepesi.*  
Rize, from northward.  
(Original dated 1844.)

[68] (page 446).



*Kemalpaşa.*  
Hopa, 152°, 10½ miles.  
bearing 152°, 10½ miles.  
Hopa and adjacent coast.  
(Original dated 1844.)  
*Perontı burnu.*  
*Arhavi*  
(*Arkhava*)

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denizi - sea

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